

Industrial

Standardization

and Commercial Standards Monthly

Engineering
Library



July
Standard Bolts
and Nuts Serve
All Industries

(See Page 165)

1941

American Standards Association

Officers

R. E. Zimmerman, President

P. G. Agnew, Secretary

Cyril Ainsworth, Assistant Secretary

Board of Directors

- | | |
|--|--|
| R. P. Anderson, secretary, Division of Refining, American Petroleum Institute, New York—Chairman, ASA Standards Council | Howard Coonley, chairman of Board, Walworth Company, New York—Manufacturers Standardization Society of the Valve & Fittings Industry |
| S. Bruce Black, president, Liberty Mutual Insurance Company, Boston, Mass.—National Association of Mutual Casualty Companies | F. M. Farmer, vice-president, Electrical Testing Laboratories, New York—Past-Chairman, ASA Standards Council |
| Carl Breer, executive engineer, Chrysler Corporation, Detroit, Michigan—Automobile Manufacturers Association | Wm. F. Groene, vice-president, R. K. LeBlond Machine Tool Company, Cincinnati, Ohio—National Machine Tool Builders' Association |
| Lyman J. Briggs, director, National Bureau of Standards, Washington, D. C.—U. S. Department of Commerce | J. Edgar Pew, vice-president, Sun Oil Company, Philadelphia—American Petroleum Institute |
| G. S. Case, chairman of Board, Lamson and Sessions Company, Cleveland, Ohio—American Society of Mechanical Engineers | Haraden Pratt, vice-president and chief engineer, Mackay Radio and Telegraph Company, New York—Institute of Radio Engineers |
| A. K. Chapman, assistant vice-president and production manager, Eastman Kodak Company, Rochester, N. Y.—Photographic Manufacturers Group | Edmund A. Prentiss, Spencer, White & Prentiss, Inc., New York—Past-President, American Standards Association |
| H. P. Charlesworth, assistant chief engineer, American Telephone & Telegraph Company, New York—ASA Telephone Group | G. J. Ray, vice-president, Delaware, Lackawanna & Western Railroad Co., New York—Association of American Railroads |
| C. L. Collens, president, Reliance Electric & Engineering Company, Cleveland, Ohio—National Electrical Manufacturers Association | Jerome Strauss, vice-president, Vanadium Corporation of America, New York—American Society for Testing Materials |
| | R. E. Zimmerman, vice-president, U. S. Steel Corporation, New York—American Iron and Steel Institute |

Standards Council

- | | |
|---|--|
| R. P. Anderson, secretary of the Division of Refining, American Petroleum Institute, New York, Chairman | H. S. Osborne, operating results engineer, American Telephone & Telegraph Company, New York, Vice-Chairman |
|---|--|

Chairmen of Correlating Committees

- | | |
|---|--|
| Building—Rudolph P. Miller, Consulting Engineer, New York | Highway Traffic—A. M. Wolf, Consulting Engineer, New York |
| Consumer—Irwin D. Wolf, vice-president, Kaufmann Department Stores, Inc., Pittsburgh, Pa. | Mechanical—Alfred Iddles, Babcock & Wilcox Co., New York |
| Electrical—C. R. Harte, Connecticut Company, New Haven, Conn. | Mining—Dan Harrington, chief, Health & Safety Branch, U. S. Bureau of Mines, Washington, D. C. |
| Safety—Walter S. Paine, Aetna Casualty & Surety Co., Hartford, Conn. | |

ASA Member-Bodies

Am. Gas Assn
Am. Home Economics Assn
Am. Institute of Bolt, Nut & Rivet Mfrs
Am. Institute of Elec Engineers
Am. Institute of Steel Construction
Am. Iron & Steel Institute
Am. Petroleum Institute
Am. Soc of Civil Engineers
Am. Soc of Mechanical Engineers
Am. Soc for Testing Materials
Am. Soc of Tool Engineers
Am. Transit Assn
Am. Water Works Assn
Assn of American Railroads
Assn of Gas Appliance and Equipment Mfrs
Automobile Mfrs Assn
Cast Iron Pipe Research Assn
Copper & Brass Research Assn
Electric Light and Power Group:
Assn of Edison Illuminating Companies
Edison Electric Institute
Federal Housing Administration
Federal Works Agency
Fire Protection Group:
Associated Factory Mutual Fire Insurance Companies
Nat Bd of Fire Underwriters
Nat Fire Protection Assn
Underwriters' Laboratories, Inc

Institute of Radio Engineers
Mfrs Standardization Soc of the Valve and Fittings Industry
Nat Assn of Mutual Casualty Companies
Nat Conservation Bureau
Nat Electrical Mfrs Assn
Nat Machine Tool Builders' Assn
Nat Retail Dry Goods Assn
Nat Safety Council
Outdoor Advertising Assn of America, Inc
Photographic Mfrs Group:
Agfa Ansco Division of General Aniline & Film Corporation
Eastman Kodak Company
Soc of Automotive Engineers
Telephone Group:
Bell Telephone System
U. S. Department of Agriculture
U. S. Department of Commerce
U. S. Department of the Interior
U. S. Department of Labor
U. S. Govt Printing Office
U. S. Navy Department
U. S. Treasury Department
U. S. War Department

Am. Automobile Assn
Am. Council of Commercial Laboratories
Am. Gear Mfrs Assn
Am. Hospital Assn
Am. Institute of Architects
Am. Soc of Heating & Ventilating Engineers
Am. Soc of Refrigerating Engineers
Am. Trucking Assns, Inc
Am. Welding Society
Anti-Friction Bearing Mfrs Assn, Inc
Assn of Iron and Steel Engineers
Associated General Contractors of America
Brick Mfrs Assn of New York
Grinding Wheel Mfrs Assn
Gypsum Assn
Heat Exchange Institute
Illuminating Engineering Society
Industrial Safety Equipment Assn
Insulation Board Institute
Internat Acetylene Assn
Modular Service Assn
Nat Elevator Manufacturing Industry, Inc
Nat Lime Assn
Radio Mfrs Assn
Soc of Motion Picture Engineers
Structural Clay Products Institute

Associate Members

Am. Assn of Textile Chemists and Colorists

Company Members—Some 2,000 industrial concerns hold membership either directly or by group arrangement through their respective trade associations.

Industrial Standardization

And Commercial Standards Monthly

Published Monthly by

American Standards Association

29 West 39th Street, New York, N. Y.

with the cooperation of the National Bureau of Standards

RUTH E. MASON, Editor

Our Front Cover: Courtesy American Institute of Bolt, Nut and Rivet Manufacturers.

For the Engineer in Industry—

Serving All Industries!—Bolts and Nuts. By W. C. Stewart	165
Electrical Advisory Committee Named to Help Defense Program	174
Standard Tests for Molding Powders Assure Good Results on Insulators. By T. Smith Taylor	175
ASA Approves Revised Test for Insulating Oils	177
Newly Approved Government Specifications.. ..	178
Underwriters Give Defense Products Priority. Tool Committee Studies Preferred Numbers.. ..	179
Railroad Committees Propose Standards.....	180
Ask the ASA Library	180
National Bureau of Standards Shows Six Per Cent Increase in 1940.....	181
Standardization Improves Quality.....	182
More Standardization, Less Variety Planned.. ..	183
ASTM Asks ASA Approval on 13 Pigment Standards	184
Pacific Purchaser Discusses Conveyor Belting. "ASA Work Significant" in Voluntary Regulation	187
Bureau of Standards Radiometry Publications Government to Develop Plastics Standards... ..	190
ASA Standards Activities.....	191

In the Building Field—

Reinforced Gypsum Concrete Building Code Requirements Approved as American Standard. By Henry J. Schweim.....	169
New Concrete Standard Starts Building Requirements Series	172
Brochure Tells About Building Coordination.. ..	173
Air Conditioning Association Standards.....	178
Heating Contractors Association Reports Action on Standards.....	182
Lumber Decree Outlines Principles for Use of Standards and Labels	183
NFPA Stops Work on Model Electrical Law.. ..	184
Standardization Aids Lower Costs, Increases Volume in Housing	188

Government Research Reported to Help in Design of Plumbing	188
--	-----

For the Purchasing Agent—

How Standards Help the Purchasing Agent.. ..	190
--	-----

For the Consumer

Directory of Consumer Services.....	174
British Standardize Food Containers.....	177
Women Want Standards	184
Meat Standards Show New Developments....	185
Retailers Find Savings in Standardization....	185
Brass Bands Better Than Orchestras.....	187
Revised "Rules" for Cotton Textiles.....	187
New Unit Describes Vitamin D Content in Poultry Feed	187
Proposed Regulations for Foods for Special Dietary Uses	189

For the Municipality—

Use of Specifications Brings Lower Costs for Fire Hose	179
Street Lighting Recommendations.....	186
NFPA Shows How to Defend Against Air-Set Fires	186

Foreign—

South Africa Considers More Standardization. Foreign Standards Available for Loan.....	189
Draft Standards Issued by Great Britain, and New Zealand	190

Miscellaneous—

Baker Heads ASTM Committee on Electrodeposited Coatings	174
IES Elects W. C. Brown President.....	177
Martino Named as Alternate on ASA Standards Council	179
War Department Names Alternates on ASA Standards Council	180



Reg. in U. S. Pat. Off.

**Standardization is dynamic, not static. It means
not to stand still, but to move forward together.**

Subscription price \$4.00 per year U. S. and
Canada (foreign \$5.00); Special to schools
and libraries \$2.00 (foreign \$3.00);
single copies 35 cents

July, 1941

Vol. 12, No. 7

Entered as Second Class Matter February 14, 1941, at the Post
Office at New York, N. Y., under the Act of March 3, 1879.

What Step Do YOU Suggest?

MR. P. G. AGNEW, *Secretary,*
AMERICAN STANDARDS ASSOCIATION,
New York, N. Y.

RAILWAY BUSINESS ASSOCIATION
Chicago, Illinois, June 10, 1941

DEAR MR. AGNEW: I am deeply interested in "The Role of Standards in the System of Free Enterprise." With Mr. Howard Coonley, you have prepared for circulation a very well worthwhile paper and illustrated therein how, by cooperative steps, so much has been accomplished in fixing important industrial standards. Standardization of thought and action has almost no limitation in our economic life if the same confidence, goodwill, and disposition to give and take can be applied in economic fields beyond that in which you have provided so significant an illustration.

You refer to organization efforts and to the fact that no one organization really represents and speaks for the business interests of this country. . . .

You hint, however, toward the possibility of extending the influence of organizations serving varied lines of business in bringing about a better understanding between the business interests themselves, and between these interests and Federal and State authority. I hope that you and Mr. Coonley will further address yourselves to that particular field of association. A common understanding of the essentials was never more needed than now, and if American business does not address itself to this effort, it may be all too late to overcome certain tendencies of a political character that undermine free enterprise as we have been taught to understand it. . . .

The business interests of the country are highly organized, mostly with respect to the special fields represented. Is there no way in which, informally to start, and later perhaps out of experience in a more formal manner, we can consolidate business thinking along sound and progressive lines that because of its soundness and forwardlooking, will exert those influences on business, on Government, and on social relationships, that will tend to hold us together in the effort to carry forward the underlying principles of American business in respect of its relation to Federal and State authority?

Very sincerely yours, (Signed) HARRY A. WHEELER, *President.*

DEAR MR. WHEELER: Many thanks for your exceedingly fine letter of June 10 which is an inspiration to us.

You raise the question of the extension of the cooperative techniques that have been developed in standardization work to other fields in our economic life. We in the ASA are in complete agreement with your point of view. We feel that in the present field of the ASA we have barely scratched the surface. . . .

Your last sentence is an exciting proposal. But unfortunately it is as tough as it is exciting. So few executives seem to understand that a constructive policy, and not merely a negative attitude toward these basic problems is necessary if we are to have sound industry-government relations. Politicians have a saying that "you cannot beat somebody with nobody." Just so, industry cannot change a trend by mere negation.

We have tried to take one very small step in "consolidating" business thinking by circulating this paper to a considerable group of trade associations. The response has been gratifying. . . .

To influence the three principal organizations of a general nature in the direction you indicate, that is, the Chamber of Commerce, the National Association of Manufacturers, and the National Industrial Conference Board, would be of special importance, since they provide the three outstanding forums for the discussion of general economic policies by top executives of business.

Do you as a former president of the Chamber think it would be feasible to get the heads of these three important bodies to work jointly toward "consolidating the business thinking" along such progressive lines? . . .

Cordially, (Signed) P. G. AGNEW.

Serving All Industries!

— Bolts and Nuts

ONE of the best guides to economical production-use of bolts and nuts is the newly revised American Standard for Wrench Head Bolts and Nuts and Wrench Openings (B18.2-1941). Briefly, the new standard covers square and hexagon bolt heads and nuts, thread lengths, hexagon head cap screws, square head set screws, and wrench openings. This revision serves to illustrate the utility of standardization of such commonly used products as bolts and nuts.

Until the beginning of this century the manufacture of bolts and nuts was less an industry than an art. Bolts were "rods of iron with a knob on one end and a wrinkle on the other." Men carried in their heads most of the "know how" and there was little in the way of standard practice. Nuts were made to manufacturers' standards, shop standards, narrow gage, wide gage, P-sizes, M-sizes, G-sizes, B-sizes. An early manufacturer's catalog showed four "manufacturers' standard" sizes and twenty-seven "extra" sizes of hexagon nuts for one bolt diameter. In fact, bolts and nuts were tailor-made to almost everyone's individual taste. The development of mass-production industries, however, has made it necessary that these products be limited as to varieties and satisfactory as to form and dimensions, no matter where obtained or used. Today, bolt heads are not just "knobs"—they are simplified in types and universally made and used to standard dimensions and limits.

Used Like Salt and Pepper

Standardization of such widely used products as bolts and nuts is of unique value. This is illustrated by the fact that these products are almost the last thing considered by a designer and often he ignores them entirely. To him, bolts and nuts are shelf-hardware and he expects to get them out of stock when he wants them and without complicated and detailed specification. The chef prepares the "piece de resistance" with little thought to the salt and pepper. Likewise, the more than 100,000,000 bolts and nuts used every day, sprinkled on practically every conceivable kind of apparatus, are taken for granted—yet, not a battleship, baby carriage, nor bomber moves until the last bolt and nut is in place. It

Revised standard gives dimensions for square and hexagon bolt heads and nuts, thread lengths, hexagon head cap screws, square head set screws, and wrench openings.

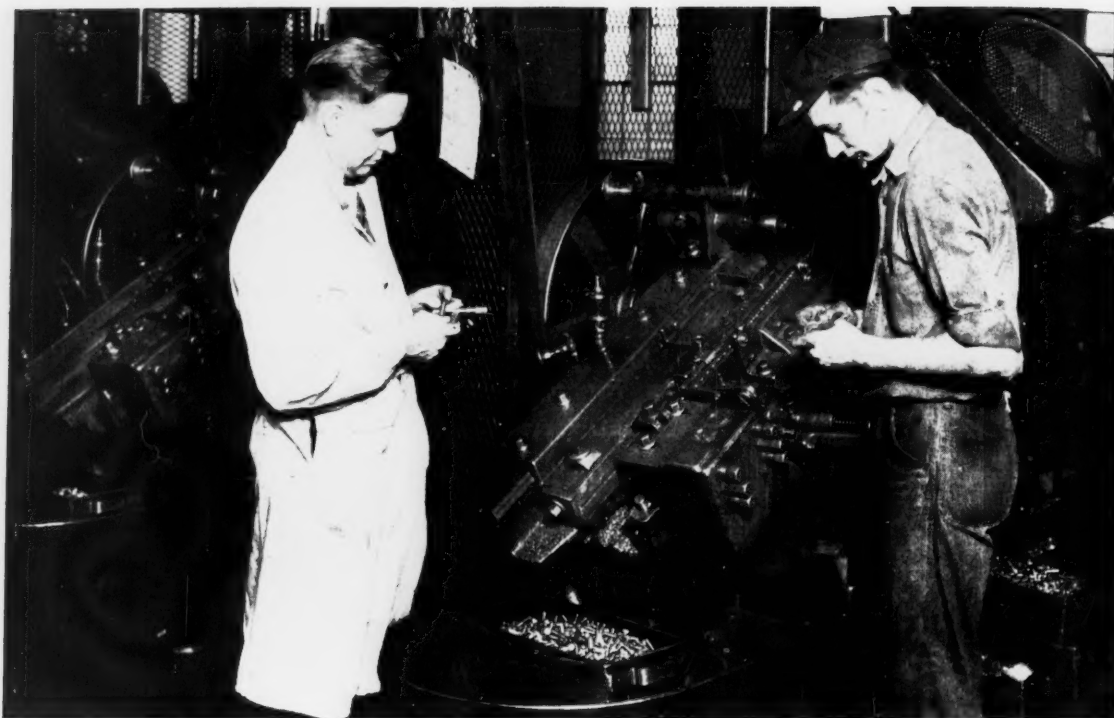
by W. C. Stewart¹

Secretary, ASA Sectional Committee on Bolt, Nut, and Rivet Proportions

is not difficult to imagine the confusion and wasted time and effort that would occur in modern industry if bolts and nuts were not standardized and immediately available in satisfactory form when required.

The difficulties which the subcommittee has encountered in preparing this standard may be readily appreciated when we consider the great variety of methods of making these products and the divergent demands of different types of users. Bolt heads may be hot forged, cold upset, or machined from a solid bar; nuts may be cold punched, hot pressed, cold forged, or machined from the bar; and there is a variety of finishing methods. Furthermore, each of these processes produces characteristic variations in dimensions or finish, depending upon the particular kind of equipment used. All of these processes must be considered, for each one has its advantages and may be the most economical process for certain sizes, lengths, kinds of raw material, or types of finish. Problems are multiplied by different wants of users—some want narrow widths of heads or nuts to save material and weight, or because they take up less room on machinery, while others want wide heads and nuts because hole clearances are large and more bearing surface is needed. Some want thick heads and

¹ Technical Adviser, American Institute of Bolt, Nut, and Rivet Manufacturers.



Bolts, nuts, and screws are not only the "salt and pepper" of industry but are themselves produced by mass-production processes. The machine shown here is responsible for threading screws

nuts because they get greater wrench grip, particularly in cap screws which are driven home with a wrench rather than being merely held while a nut is wrenched on, while others want thin heads and nuts because they do not project so far and are less liable to interfere with adjacent parts of a mechanism. Some want a fine finish for appearance or close tolerances, while others cannot justify the added cost of producing such degree of finish or tolerance. It is a tribute to democratic processes that a committee group can sit together and by give-and-take resolve these many divergent viewpoints into a consolidated recommendation.

The scope of this new standard and the changes which have been made are given below in some detail.

BOLT HEAD SERIES.—

Two series of bolt heads are provided, regular and heavy. The regular series is recommended for general use and the head dimensions and resulting strengths have been proven adequate by theoretical analysis and many tests. They are in accord with tendencies toward more economical use of material consistent with an ample margin of safety. Heavy bolt heads are somewhat higher

and wider and are used only where greater bearing surface or wrenching surface is considered essential.

Two standard types of finish are specified for each of the two series of bolt heads. Unfinished heads, square and hexagon, are in the as-formed condition and are not machined nor further treated on any surface. Semifinished heads are provided only in the hexagon shape, square semifinished heads being deleted as of little use. They are similar to the unfinished heads, but the bearing surface has been machined or otherwise treated to produce a round, 1/64-in.-thick boss, known as a washer face which is smooth and more nearly square with the axis of the bolt. Finished bolt heads are mentioned, but the exact finish is left to individual specifications.

CAP SCREW HEADS.—

Full finished hexagon cap screw heads are included but the finish is more fully defined. They are washer faced and have all surfaces of body and head machined or otherwise treated to provide an equivalent appearance. Also, provision is now made that variations from this finish may be obtained subject to agreement between user and manufacturer.

Hexagon cap screw heads are somewhat higher than semifinished regular bolt heads and in sizes 9/16 and over are slightly narrower. The greater height of head permits better wrench grip which is considered desirable for cap screws which are driven home by wrenching and the narrower width is permissible since the product is used in close-fitting holes and is desirable since it occupies less room and permits narrower bolting flanges in equipment.

Other additions to the cap screw table are the specification of radius of fillet under the head and adoption of a thread length of two diameters plus $\frac{1}{4}$ inch for both coarse and fine threads.

SET SCREW HEADS.—

Square set screw heads are included in the standard and the only change made is to specify tolerances for the diameter of the neck under the head which is sometimes provided in certain sizes of screws.

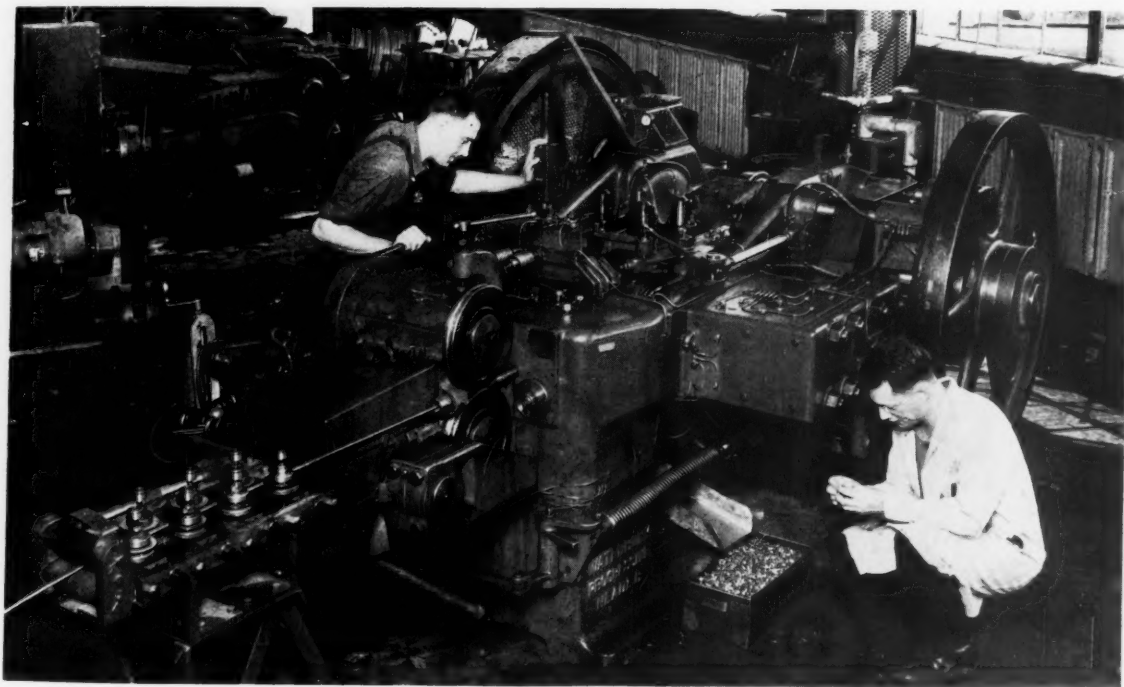
NUT SERIES.—

Three series of nuts are included (in addition to machine-screw and stove bolt nuts discussed below)—regular, heavy, and light. As in the case of bolt heads, the regular series is intended for all general purposes and the heavy series, which is slightly thicker and wider, is used only where increased bearing surface is considered

essential or where the nut must be thicker to provide unusual wrenching surface. In the present revision the range of heavy nuts has been extended below $\frac{1}{2}$ inch to $\frac{1}{4}$ inch, since it has been found that there is considerable usage of these sizes. The light series is narrower than the regular series and is used for extreme saving in weight. There are three types of light nuts provided, all of the same width, but differing in height—light nuts, light thick nuts, and light castle nuts. Jam nuts are specified for all series of nuts in the hexagon shape only, square jam nuts having been deleted.

Regular and heavy nuts, both square and hexagon, are obtainable in the unfinished condition. All three series, regular, heavy, and light (and the different types of light nuts) are provided in the semifinished condition in the hexagon form only. Unlike semifinished bolts, semifinished nuts may be either washer faced or chamfered on the bearing surface. In either case, however, the bearing surface is machined or otherwise treated to provide a smooth surface more nearly square with the axis of the nut.

It should be noted that the thickness of semifinished regular and heavy nuts has been reduced slightly in the present revision in sizes $1\frac{1}{4}$ inch and larger. This is to permit production of semifinished nuts by facing the bearing surface of unfinished nuts.



This machine puts the heads on the screws, bolts, and nuts

SLOTTED NUTS.—

Provision is made for slotted, semifinished, hexagon nuts, for locking with cotter pins. In the old standard, different dimensions of slots were specified for the different series of nuts. In the present standard, however, a standardized slot has been adopted which is the same for all series.

As it has been found that there is no practical difference in use between slots with round or square bottoms, both types are permitted at the option of the manufacturer.

CASTLE NUTS.—

This is a slotted, semifinished, hexagon nut in the light series of width. Instead of being chamfered on the top, however, the top is cylindrical

down to the bottom of the slots where it is filleted out to the hexagon shape. The present revision incorporates a minimum diameter for the cylindrical part, dimensions for the fillet, and the slot dimensions have been changed slightly to conform to the standardized slot.

MACHINE-SCREW AND STOVE-BOLT NUTS.—

These are small, square and hexagon nuts in sizes No. 0 to $\frac{3}{8}$ inch. Square nuts are flat on both the top and bottom. Hexagon machine screw nuts are chamfered on the top and flat on the bottom, but, for special purposes, and when so specified, the bearing surface may be chamfered or washer faced.

WRENCH OPENINGS.—

Standard openings for wrenches have been included. The minimum wrench opening is larger than the maximum width of bolt head or nut by an allowance. The tolerance on wrench opening is plus and the tolerance on bolt or nut width is minus. By this means the wrench opening is always larger than the bolt head or nut so that they will always fit together. The tolerances on wrench opening and on width of bolt and nut, however, is sufficiently small so that there cannot be too great a play between them.

THREAD LENGTH OF BOLTS.—

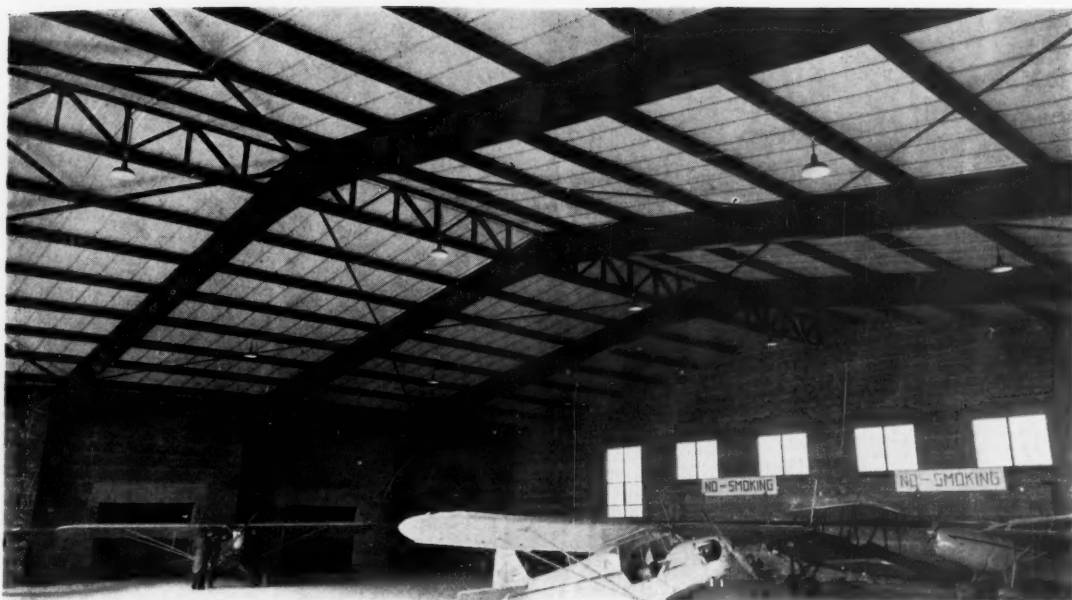
A table has been included in the new revision showing thread lengths for bolts. This is an important addition for there probably is no characteristic of bolt design that has been more subject to individual specification by users—sometimes for good reason, but in many cases simply because there was no national standard to follow. Common bolts must be stocked and it is impossible to predict the individual specifications of many users and it would be uneconomical to carry different thread lengths in stock. For this reason it is important that users specify standard thread lengths since it is costly to set up machinery and make short runs of special thread lengths.

As has been pointed out, bolts and nuts are shelf-hardware to most users. The development of this standard on bolt heads and nuts makes it possible to provide satisfactory shelf stock of these products and to eliminate the confusion, supervision, and waste effort, both in the manufacturer's and user's plant, that occurs with specially designed products. For this reason, both manufacturers and users are urged to review this new standard and attempt in so far as possible to follow it in their regular schedules. This is particularly important today when emergency conditions make peak production necessary in the plants of both manufacturers and users of bolts and nuts.

Long-Continued Program Gives Industry Bolt, Nut Standards

"Bolts, nuts, and rivets . . . are of many types, many diameters, many lengths. They are made of many different materials and are a service necessity to all industry. When they are all taken into consideration, it is estimated that there are over 400,000 different catalogued items. They can be ordered by name and over-all dimensions. Made to American standards, they can be taken off the hardware shelf any place in the world, and, though the parts may come from scores of manufacturers, the planned interchangeability is such that a misfit is practically unknown. This is the direct result of years and years of standardization and simplification work which is still carried on cooperatively within the industry, in conjunction with engineering and scientific bodies, for a constantly improved product which will meet adequately all the continuing changes in requirements."

—Herman H. Lind, president, American Institute of Bolt, Nut & Rivet Manufacturers. From an address "The Trade Associations' Part in Production for Defense," before the Panel Forum on Defense Work of Business Organizations, 29th Annual Meeting, Chamber of Commerce of the United States, Washington, D. C., April 29.



Gypsum wallboard forms and the tee or rail sub-purlins are shown in this picture of the under surface of a poured-in-place gypsum roof (see page 171)

Reinforced Gypsum Concrete Building Code Requirements *Approved as American Standard*

ON May 8, 1941, the American Standards Association approved as American Standard Building Code Requirements for Reinforced Gypsum Concrete, completing a project authorized in June, 1938. This is the first in the series of recommended building code requirements being prepared under ASA procedure to be made an American Standard. The building code program of the ASA is under the supervision of the Building Code Correlating Committee.

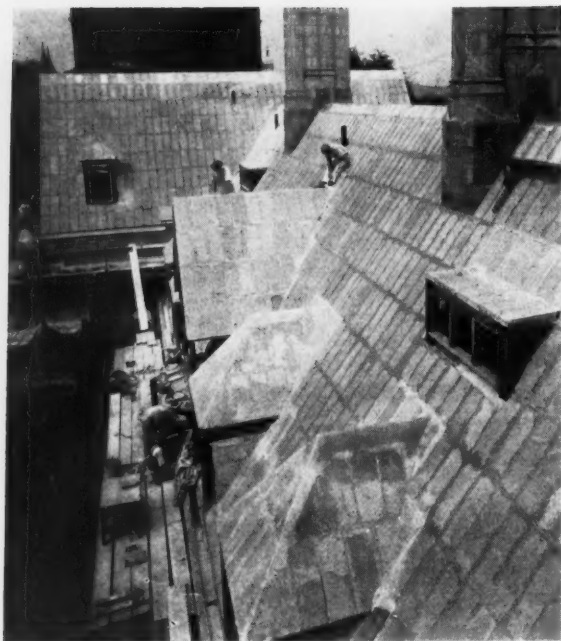
The new standard is the combined thought of many organizations and individuals concerned with the design, construction, and use of reinforced gypsum concrete floors and roofs. It was prepared by Sectional Committee A59 and sponsored by the Building Officials Conference of America and the Gypsum Association. Sectional

by Henry J. Schweim¹

*General Manager,
Gypsum Association*

Committee A59 is composed of representatives of the American Institute of Architects, American Society for Testing Materials, American Society of Civil Engineers, Associated General Contractors of America, National Bureau of Standards, Public Buildings Administration, Wire Reinforcement Institute, Building Officials Conference of America, Gypsum Association, and others.

¹ Secretary, Sectional Committee on Building Code Requirements for Reinforced Gypsum Concrete (A59).



One of the first types of precast gypsum units—solid 3 x 12 x 30 in. roof tile—here used on a steep roof with dormers

Although the gypsum industry, through the Gypsum Association, has long had recommended requirements for gypsum floors and roofs, this is the first national standard adopted for reinforced gypsum concrete. These requirements are intended to regulate the materials used in reinforced gypsum concrete floors and roofs, their design, and construction. They may be included in any building code that is being revised or rewritten or they may be adopted as a separate ordinance.

The Development of the Standard

The personnel of the Sectional Committee was approved by the American Standards Association in April, 1939. Since that approval the only changes in personnel have been the appointments of Walker Lee² to represent the Building Officials Conference of America and Edward W. Roemer as Member-at-Large.

The organization meeting of the committee was held in June, 1939. Previous to the meeting a preliminary draft of the requirements was circulated to the members for the purpose of eliciting comments.

² Mr. Lee was elected President of the Building Officials Conference of America at the 1941 Annual Meeting of the Conference, in Kalamazoo, Michigan, May, 1941.

A second draft was distributed to the Committee in August, 1939, and a third draft in November, 1939. Each draft incorporated those amendments to the previous draft approved by the members of the Committee. Following its approval, the third draft was submitted to the Building Code Correlating Committee for consideration by the BCCC Editorial Committee and the advisory Committee on Working Stresses. The Advisory Committee on Working Stresses approved the proposed working stresses on October 28, 1940, but suggested that certain of the provisions be reconsidered in the interest of clarification. A list of such items was submitted to the Committee and approved.

The fourth and final draft incorporating the aforementioned changes and changes in arrangement suggested by the Editorial Committee was submitted to the Sectional Committee in January, 1941 and approved by them.

The working stresses for reinforced gypsum concrete contained in the Standard were established by the Committee in cooperation with the Advisory Committee on Working Stresses of the Building Code Correlating Committee.

Types of Gypsum Floors and Roofs

Gypsum floors and roofs are either poured-in-place or precast. The suspension system is the



Metal-edged gypsum planks are laid without mortar, and are clipped to the supports. They are cantilevered over supports, permitting a variation in the spacing of the steel.



A floor of gypsum planks, with the planks applied over steel joists

original gypsum floor and roof employing poured-in-place gypsum concrete. In this system, gypsum concrete is poured over parallel and uniformly spaced steel cables which are continuous over intermediate supports. The cables are put in uniform deflection at the time they are installed by means of a $\frac{5}{8}$ -inch round deflection rod, placed mid-way between each support. The loads are transferred to the cables through the gypsum and the resulting tension in the cables is transmitted to the end beams and purlins; the horizontal thrust being taken up by bracing members in the end panels.

Tee Sub-Purlins Are Popular

One of the most popular systems in use today employs tee or rail sub-purlins with a permanent gypsum wallboard form over which gypsum concrete is poured. (Picture on p 169.) Its popularity is due to its light weight, adaptability, and low cost—there are no forms to be removed. In this system the tees or rails are spaced $32\frac{1}{2}$ inches on centers and are securely attached to the supporting construction. Wallboard is placed between and rests upon the flanges of the tees or rails. A galvanized steel fabric or mat is placed over these materials to reinforce the gypsum fiber concrete which is poured in place. The overall minimum thickness of the slab is $2\frac{1}{2}$ in.

There are a number of types of precast gypsum units which are reinforced with a wire mat, steel channels, or other suitable reinforcing. Precast units came into use about 30 years ago. Solid $3 \times 12 \times 30$ in. roof tile is one of the first types and is still one of the standard tiles for this purpose.

These tiles are supported on the flanges of tee or rail sub-purlins, which are spaced according to the tile length. (See picture top of p 170.)

There are two types of solid tile ranging from 6 ft to 10 ft in length. These are commonly referred to as "tongued-and-grooved" units or planks; one type is metal edged and the other type is plain edged. The metal edged type is 2 in. thick, 15 in. wide, and comes in lengths of 6, 8, and 10 ft. The plain edged type is $2\frac{1}{2}$ in. thick, 10 in. wide, and 6 ft long. Continuity is provided in the slabs by the interlocking of the units. The ends of the units need not come directly over the supports. This is shown quite clearly in the illustration above and at the bottom of p 170.

The Requirements for Reinforced Gypsum Concrete

The standard is divided into five main sections, entitled: "Materials," "Strength of Gypsum Concrete," "Allowable Stresses," "Design," and "Inspection."

The section on "Materials" defines gypsum concrete, aggregate and reinforcement, and sets forth the minimum requirements for these materials requiring that they shall conform to ASA and ASTM standard specifications where those specifications apply.

Section 2 prescribes the minimum compressive strength required of classes 1, 2, and 3 gypsum concrete and the method by which the strength shall be determined. Gypsum concrete is classified according to mixture; concrete in each class

is required to develop the following minimum strengths in compression:

Class 1 Neat (containing gypsum and water only)	1800 lb per sq in.
Class 2 Containing not more than 3 per cent, by weight of wood chips, shavings, or fiber.....	1000 lb per sq in.
Class 3 Containing not more than 12½ per cent by weight, of wood chips, shavings, or fiber.....	500 lb per sq in.

Classes 1 and 2 concrete are used in the manufacture of precast gypsum concrete slabs and Class 3 concrete is used for poured-in-place construction.

The working stresses for gypsum concrete, the maximum tension in the steel reinforcement, and the modulus of elasticity, are covered in Section 3.

Section 4, "Design," provides that the general assumptions and principles established for reinforced concrete shall apply in the design of reinforced gypsum concrete in so far as they are pertinent. The safe load for precast gypsum concrete slabs which cannot be analyzed in accordance with established principles of mechanics is

required to be determined by loading a full size test panel with the load applied along two lines, each distant one-fourth of the clear span from the support. The safe load uniformly distributed is taken as one-fifth of the total load causing failure of the test panel. This, in general, applies to the tongued and grooved type, where continuity is provided by the interlocking of the slabs.

A sub-section entitled "Exposure" stipulates that gypsum concrete shall not be used where exposed directly to the weather or where subject to frequent or continuous wetting. This may be termed a precautionary measure since gypsum floor and roof slabs are not exposed directly to the weather and are not normally subjected to frequent or continuous wetting, being adequately protected by flooring or roofing.

Section 5 requires a competent inspector to be present when cast-in-place gypsum concrete is being mixed and deposited.

Printed copies of these Requirements will be sent to building officials and others interested in order to acquaint them fully with the requirements for reinforced gypsum concrete.

New Concrete Standard Starts Building Requirements Series

THE new American Standard Building Requirements for Reinforced Gypsum Concrete, now approved and published by the American Standards Association, is the first of a series of building standards being prepared by technical committees under the supervision of the ASA Building Code Correlating Committee.

This series of standards will provide detailed requirements which can be referred to by local building authorities and which will supplement a basic building code to be prepared after all the standards are completed. Both the standards and the basic code can be used by local building authorities as a guide for the revision or development of building regulations.

When the Department of Commerce Building Code Committee was discontinued in 1934, the American Standards Association was requested to continue work on good building code requirements in cooperation with the National Bureau of Standards. This the ASA agreed to do, since it was evident that great need existed for these standards. In a survey carried out by the Bureau it was found that more than 1,500 building codes, developed by as many independent code authorities, were being used throughout the United States.

In many cases these authorities were hampered by lack of proper personnel, research, and testing facilities, and did not have the means of keeping abreast of rapidly changing conditions and scientific developments. This frequently resulted, it was found, in code requirements which were unnecessarily severe in their restrictions, or which varied to such an extent that increased cost of construction and retarded building activity resulted. A considerable number of the building codes in existence were from 15 to 20 years old, a recent survey disclosed, and many of these failed to make sufficient provision for ready acceptance of new materials and methods and therefore had not been kept up-to-date.

The organization of the Building Code Correlating Committee by the American Standards Association provided for orderly development of acceptable building code requirements. This committee is made up of representatives of organizations with a general interest in the subject. It is supplemented by a number of technical committees each dealing with a particular subject. Through this broad representation it is possible to arrive at a national consensus on the technical phase of the building code problem.

Technical committees under the supervision of the Building Code Correlating Committee are developing standard building code requirements for:

- Administrative requirements
- Chimneys and heating appliances
- Excavations and foundations
- Fire extinguishing equipment
- Fire protection and fire resistance
- Grandstands
- Iron and steel
- Light and ventilation
- Masonry
- Minimum design loads in buildings
- Reinforced gypsum concrete (now completed)
- Signs and billboards
- Wood

These ASA committees are investigating all possible sources of information and are basing their conclusions on results of research and composite judgment. This process may be expected to result in a product free from some of the defects now evident in many existing codes.

Already, some American Standards which have been developed in the safety code field have been used widely in the building regulations of states and municipalities. These include the Safety Code for Elevators, the Building Exits Code, the National Electrical Code, and the Fire Tests of Building Construction and Material. Several editions of these standards, which are closely related to the building code program, have been approved by the American Standards Association.

Several other standards in the program of the Building Code Correlating Committee are now in an advanced stage of development requiring only minor adjustments before they are presented to the Association for approval. It is hoped that these can be made available this year.

Brochure Tells About Building Coordination

A thoroughgoing presentation of the work being done on coordination of dimensions of building materials and equipment (ASA project A62) is now being distributed for the information of those concerned. The pamphlet, prepared by the Modular Service Association, explains the basis on which coordination is being developed. It gives specific illustrations, with drawings, showing how the 4 in. increment, decided upon by the committee as a basis for its work, can be applied in connection with various building problems. Some of the problems thus illustrated include nominal layout; brick sizes and wall dimensions; concrete block sizes and wall dimensions; masonry walls; brick veneer; window

Technical committees working under the supervision of the Building Code Correlating Committee, and the organizations acting as sponsors for their work, are:

Building Exits Code (A9)—*National Fire Protection Association.*

Building Code Requirements and Good Practice Recommendations for Masonry (A41)—*National Bureau of Standards.*

Building Code Requirements for Fire Protection and Fire Resistance (A51)—*National Bureau of Standards; National Fire Protection Association; National Board of Fire Underwriters.*

Building Code Requirements for Chimneys and Heating Appliances (A52)—*National Board of Fire Underwriters.*

Building Code Requirements for Light and Ventilation (A53)—*Federal Security Agency, U. S. Public Health Service; Federal Loan Agency, Federal Housing Administration.*

Building Code Requirements for Fire Extinguishing Equipment (A54)—*National Fire Protection Association.*

Administrative Requirements for Building Codes (A55)—*American Municipal Association; Building Officials Conference of America; Pacific Coast Building Officials Conference.*

Building Code Requirements for Excavations and Foundations (A56)—*American Society of Civil Engineers.*

Building Code Requirements for Iron and Steel (A57)—*American Institute of Steel Construction, Inc.; American Society of Civil Engineers.*

Building Code Requirements for Minimum Design Loads in Buildings (A58)—*National Bureau of Standards.*

Building Code Requirements for Reinforced Gypsum Concrete (A59)—*Building Officials Conference of America; Gypsum Association.*

Building Code Requirements for Signs and Outdoor Display Structures (A60)—*American Municipal Association; Outdoor Advertising Association of America.*

Building Code Requirements for Wood (A61)—*National Lumber Manufacturers Association; U. S. Department of Agriculture.*

Safety Code for Grandstands (Z20)—*International Association of Governmental Labor Officials.*

sizes and installation (a chart shows stock sizes of windows available for coordination); floor height; wood joist installation; and exterior doors, including nominal layout, and installation. A building layout using the coordination principle shows a sketch layout of plan and of elevation on grid of 4 in. layout lines, as well as a dimensioned nominal plan and elevation layout for use with coordinated sizes and assembly details.

The pamphlet includes a discussion of the economy which may be expected from the use

of such a coordination plan, and how the plan can be carried out.

Although copies are available to others interested, the pamphlet is primarily intended for use by members of the sectional committee, and by the six study committees which have been formed to work out details of the project. These committees cover: Masonry made of structural clay products; wood doors and windows; masonry made of concrete and cast stone; metal windows; natural stones, including granite, limestone and marble; and structural wood.

Electrical Advisory Committee Named to Help Defense Program

Formation of an electrical industry advisory committee to help speed cooperation between the electrical industry and Government on defense problems was announced June 25 by Donald M. Nelson, Director of Purchases, Office of Production Management.

The committee is one of the new Defense Industry Advisory Committees which are now being set up in the Office of Production Management according to regulations issued June 24. These committees are to clear through a Bureau of Clearance of Defense Industry Advisory Committees, and are to be presided over by a Government Presiding Officer. The Government Presiding Officer, Government Consultants representing other divisions of the Office of Production Management and departments of the Federal Government, and the Defense Industry Advisory Committee constitute a Defense Commodity Group.

Functions of the Defense Industry Advisory Committees as outlined in the regulations will be:

(a) To discuss freely any subject pertinent to the defense program at meetings duly called according to the regulation.

(b) To collect and furnish information relating to the industry to the Office of Production Management when requested to do so by the Government Presiding Officer.

(c) To render advice with respect to any matter raised by the Government Presiding Officer or by any Government Consultant who may be present at a meeting of the Defense Commodity Group.

(d) To make recommendations to the Government Presiding Officer when requested by him to do so.

Among problems which, it is expected, will be considered by the Electrical Industry Advisory Committee will be "temporary" modifications of federal specifications to permit use of substitute materials, conservation of materials, simplified

Secretarial and engineering assistance is being given to the ASA committee by the Modular Service Association. This association is a non-profit organization formed by the heirs of the late Albert Farwell Bemis in the belief that the building industry will need non-commercial help in the coordination program. The ASA project is sponsored by the American Institute of Architects and the Producers' Council, Inc.

A limited number of copies of the pamphlet are available from the American Standards Association.

practices, raw materials supply, allocation of production capacity, and standardization of production.

J. W. McNair, electrical engineer of the American Standards Association, has been appointed to serve as one of the members of this committee.

Baker Heads ASTM Committee On Electrodeposited Coatings

Officers have now been elected for a new ASTM Committee B-8 on Electrodeposited Metallic Coatings, the American Society for Testing Materials announces. They are:

E. M. Baker, Professor of Chemical Engineering, University of Michigan, *Chairman*

E. A. Anderson, New Jersey Zinc Company, *Vice-Chairman*

Gustaf Soderberg, Technical Director, The Udylite Corporation, *Secretary*

The work of the new committee will cover the formulation of specifications and methods of test for electrodeposited metallic coatings with the exception of zinc and cadmium applied to steel.

Directory of Consumer Services Lists Local Grading Offices

A Directory of Governmental Consumer Services and Agencies, recently issued by Miss Harriet Elliott, in charge of the Consumer Protection Program of the National Defense Advisory Commission, includes an appendix listing points at which grading service on dairy and poultry products is available, a list of meat-grading offices, and a list of the canned foods standardization and inspection service offices.

The Directory is Bulletin No. 3 in the consumer protection series and is available from the Office of the Consumer Commissioner, National Defense Advisory Commission, Washington, D. C.

Standard Tests for Molding Powders Assure Good Results on Insulators

by T. Smith Taylor

*Chairman, ASTM Committee D-9
on Electrical Insulating Materials*

IN recent years the handling of the powders used in the manufacturing of molded articles has become almost entirely an automatic operation. In order that a nicely finished article result from the molding operation it is essential that such properties of molding powder as particle size, apparent density, bulk factor, and powder pourability, be maintained reasonably uniform from batch to batch. It was for the purpose of guaranteeing reasonable uniformity of these properties that Method of Test D392-38 was developed by the American Society for Testing Materials.

This method of testing molding powders used in manufacturing electrical insulators includes procedures for securing representative samples of the batch or shipment, the particle size of these samples, the bulk factor of the material, and the powder pourability of the material. Each of these is of particular interest to those manufacturing finished articles from molding materials.

In securing the material for a representative sample of the batch or shipment from the original packages in which the material is shipped, the following procedure is followed. The number of packages selected from a batch for sampling is never to be less than three and is ordinarily taken as 10 per cent of the total number of packages or cartons in the shipment. If material from more than one batch is in the shipment, each batch is sampled separately in order to secure a composite blended sample. The packages selected for sampling may be chosen at random or if the sequence of manufacturing of the packages is known, the selection may be made with reference to this order.

Sampling Methods Are Standard

The material is carefully taken from the standard packages from a point about 3 inches below the top surface after the package is opened. For the smaller packages the material for the sample is taken from about 1 inch below the top surface. Sufficient material is taken from each package sampled so that the total amount of the material in the composite sample will be at least two times the quantity required to make the desired tests. This is done in order that repeat tests can be made if it is so desired. The composite sample is thoroughly mixed and blended before any material is taken from it to make the various tests.

American Standards Association approval recognizes wide acceptance of ASTM tests for molding powder.

Standard tests maintain reasonable uniformity on particle size, apparent density, bulk factor, and powder pourability.

There are two procedures, known as Method A and Method B, for making the determinations of the particle size of the materials. Each of these methods may be considered as a sieve analysis of the material. Method A is known as a complete sieve analysis and is made by using the Standard U. S. sieves given in the accompanying table.

Sieve Number	Opening-Microns
12	1680
20	840
40	420
70	210
140	105

The sieves are stacked in the order shown with a pan under the lower one. One hundred grams of material are taken from the composite sample and placed in the top sieve of the pile up. The stack of sieves is then shaken for ten minutes in a standard shaking device. The percentage of the material which is retained in each sieve and in the lower pan is determined. The cumulative total per cent of the material on each sieve and in the bottom pan is also calculated. This gives the total percentage of the material which will pass through a given sieve and be caught upon the next screen. It also gives the total percentage of the material which is larger than a given size or, if one desires, the total percentage of the material smaller than a given size.

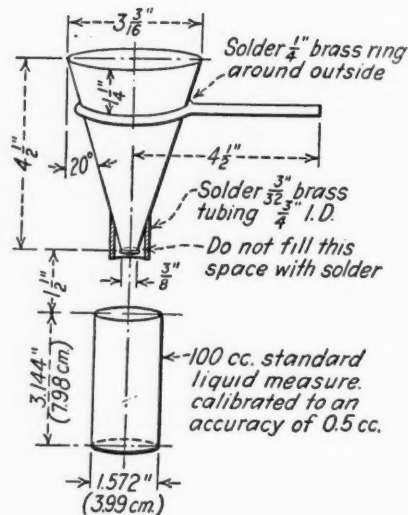
In the second or Method B only two sieves, the No. 12 and the No. 140, and the pan are used. As in Method A, a one hundred gram sample is placed on the top, or No. 12, sieve and the stack of sieves shaken in a machine sieving device for ten minutes. The amount of material retained on each sieve and in the pan is determined and expressed as percentages of the total amount. In addition to the percentages being taken note should be made of any unusual things such as large particles. In making this analysis as well as in making the analysis by Method A, there is a loss of material in the form of dust so that the total cumulative percentage will be less than 100 per cent. For differences of not over 2 per cent the amount reported as passing the finest sieve should be increased by this amount. If the difference is over 2 per cent the operations and percentages should be checked by repeating the test.

Apparent Density Is Measured

The apparent density which is useful in determining the fluffiness or bulk of molding powders is determined by use of a standard measuring cup and funnel shown in the accompanying figure. A 120 cubic centimeter well-mixed sample is taken from the general composite sample and poured into the funnel having its lower end held shut by some suitable means. The powder is then allowed to flow freely from the funnel into the cup below. If the powder cakes in the funnel it is loosened by means of a small glass rod. After the material has passed through the funnel, the excess on the top of the cup is brushed off with a straight edge. The material in the cup is then weighed to the nearest 0.1 gram and the weight in grams per cubic centimeter determined. Three such determinations are made and the results averaged. This average of the three determinations is taken as the *apparent density* of the material. This apparent density may be expressed in ounces per cubic inch by multiplying the number of grams per cubic centimeter by 0.576. It is worthy of note that these apparent density figures are only comparable for materials which have the same specific gravity after molding.

Molds Must Allow for Loose Powder

In molding articles from powder without having it preformed, it is quite essential that the ratio of the volume of the loose powder to the volume of the same material after molding be known. This is necessary in order that in designing the molds and preforming cavities they be made sufficiently large to hold sufficient material to form the final molded piece or preforms.



Standard measuring cup and funnel used for measuring apparent density of molding powders

This ratio of the volume of the loose molding powder to the volume of the finished molded piece is known as the *bulk factor*. By transformation into proper units this factor is also equal to the ratio of the specific gravity of the molded piece to the apparent density of the powder. To determine the bulk factor it is only necessary to divide the average specific gravity of the molded piece by the average apparent density of the molding powder in grams per cubic centimeter. An important fact with respect to the bulk factor is that it is comparable between all grades of molding compounds.

Powder Must Flow Uniformly

In the use of molding compounds in automatic processes in particular, it is of considerable importance that the molding powder feed readily through hoppers and deliver uniform weights in a given time into mold cavities or dies of a tableting machine as the case may be. This property of flowing through hoppers at a uniform rate is measured by what is called *powder pourability*. This property is used to determine the rate at which a tableting machine is operated and to determine the correct mold charge to use for a given molded article. Correct mold charges are taken as the weights which produce the constant molded volume of the piece to be molded. Comparable quantities of material are used in determining the powder pourability by taking some

multiple value of the molded specific gravity. In the regular test for pourability, a sample of the blended powder equal to one hundred times the molded specific gravity is selected. This sample is worked on a paper till there is no tendency of the material to pack or cake. The sample is then poured lightly into the funnel shown in the accompanying figure, with the small end of the funnel closed. The bottom of the funnel is then quickly opened and a stop watch started at the same instant. The powder is allowed to run out of the funnel and the watch is stopped

ASA Approves Revised Test For Insulating Oils

A revised edition of the American Standard Methods of Testing Electrical Insulating Oils (C59.2-1941; ASTM D 117-40) was approved by the American Standards Association in May. The revision in this standard was a minor one to include a reference to the Tentative Method of Test for Color of Lubricating Oils and Petrolatum by Means of ASTM Union Colorimeter (ASTM D 155-39 T). This method of determining the color of insulating oils is a combination of Tentative Method of Test for Color of Lubricating Oils by Means of ASTM Union Colorimeter (D 155-34 T) and Test for Color of Petrolatum by Means of ASTM Union Colorimeter (D 218-34 T). Before the present revision, the American Standard Methods of Testing Electrical Insulating Oils had referred to method D 155-34 T as the method to be used.

The standard covers sampling, specific gravity, color, viscosity, flash point, pour point, neutralization number, mineral acids (chlorides and sulfates), free and corrosive sulfur, steam emulsification test, and dielectric strength.

Copies of this standard are available at 25 cents each.

British Standardize Food Containers As War Emergency Measure

The most recent British War Emergency Specification on sizes of tins and cans for food products and commodities other than food products, B.S. 866, has just been received in the ASA office. The standard was prepared in collaboration with the Ministry of Supply and the Ministry of Food.

Some 70 tables of different commodities ranging from milk to medicines and from fish to fertilizers are included. Preparation of these tables meant the calling together of representatives of these different industries concerned and reaching agreement between the manufacturers

at the instant the last grains of the material leave the lower end of the funnel. The time in seconds for the funnel to discharge is a measure of the pourability. The shorter this time the more readily the material pours. Such pour tests, however, are not well adapted to materials which have a bulk factor as determined by the method outlined above of over 3. Furthermore, it can be generally assumed that powders which are not measurable by this pour test will not feed well without the introduction of special feeders.

and the users of tinplate, the BSI announces.

"Besides freeing a large amount of steel," the BSI declares, "the Order has cut out a considerable number of odd sizes and uneconomical sizes of containers, and will thus render easier the distribution of articles which are served over the counter, involving less labor and fewer stocks in every stage of manufacture, and a more economical distribution in other ways. It automatically prevents the making and use of any new containers and thereby frees for the war effort not only material but also skilled labor which would be required for the making of tools and dies and so forth. Moreover, the fact that there are fewer sizes and that these are more economical in shape means that it will be possible to produce any number of containers not only with less labor, but with labor of a less skilled type, which is very important."

The BSI is now working on similar standards for drums, kegs, pails, and churns, and for composite containers made with paperboard bodies and tinplate ends.

Illuminating Engineering Society Elects W. C. Brown President

Willard C. Brown, executive engineer of the Nela Park Engineering Department, General Electric Company, Cleveland, has been elected president of the Illuminating Engineering Society, and will assume office October 1.

Other national officers elected are:

A. Dexter Hinckley, assistant to the Dean of Engineering, Columbia University, New York, *General Secretary*

Gilbert K. Hardacre, Public Service Company of Northern Illinois, Chicago, *Treasurer*

Howard M. Sharp, manager, Lighting Bureau, Buffalo, Niagara & Eastern Power Corporation, Buffalo, N. Y., *Vice-President*

Ralph G. Raymond, Commonwealth Edison Company, Chicago, and Lee E. Tayler, Detroit Edison Company, Detroit, were elected to serve as Directors of the Society.

Newly Approved Specifications Published by Government

The Federal Government has recently issued the following newly approved specifications and amendments. They may be procured from the Superintendent of Documents, Government Printing Office, Washington, D. C., at five cents each.

Asphalt: (for use in) road and pavement-construction. (Superseding SS-A-706) SS-A-706a July 1, 1941

Bacon: smoked. (Amendment-1) PP-B-81a Aug. 1, 1941 (Applicable to Navy Department purchases only)

Bars: reinforcement, (for) concrete. (Amendment-1) QQ-B-71a Aug. 1, 1941

Beef: dried, sliced, canned. (Amendment-3) PP-B-211 Aug. 1, 1941

Cereals, breakfast: prepared (ready-to-eat). (Amendment-2) N-C-196 Aug. 1, 1941

Cheese: American (chedder or American-chedder) and process American. (Amendment-2) C-C-271a Aug. 1, 1941

Chickens: dressed (broilers, fryers, and roasters). (Amendment-1) PP-C-251b Aug. 1, 1941 (Applicable to Navy Department purchases only)

Connectors, wire: pressure (solderless). (Amendment-1) W-C-601 Aug. 1, 1941 (Applicable to Navy Department purchases only)

Crab meat: canned. (Amendment-1) PP-C-651 Aug. 1, 1941

Crackers and cookies. (Amendment-2) EE-C-651a Aug. 1, 1941

Fowl: dressed (fricasee). (Amendment-1) PP-F-611a Aug. 1, 1941 (Applicable to Navy Department purchases only)

Hams: sweet-pickle-cured, smoked. (Amendment-3) PP-H-71 Aug. 1, 1941 (Applicable to Navy Department purchases only)

Hose: pneumatic, wrapped. (Amendment-3) ZZ-H-499 Aug. 1, 1941

Ink: writing. (Superseding TT-I-563) TT-I-563a June 15, 1941 (Effective date of March 15, 1941 shown on the specification is extended as indicated)

(Continued)

Iron, gray: castings. (Amendment-2) QQ-I-652 Aug. 1, 1941

Lumber and timber: softwood. (Amendment-1) MM-L-751B Aug. 1, 1941

Luncheon meat. (Amendment-1) PP-L-791a Aug. 1, 1941 (Applicable to Navy Department purchases only)

Milk, dry, powdered: skimmed and whole. (Amendment-2) C-M-351b Aug. 1, 1941

Milk: evaporated. (Amendment-2) C-M-371 Aug. 1, 1941

Pencils, mechanical: leads, and erasers. (Superseding SS-P-151) SS-P-186 Aug. 1, 1941

Rope: manila. (Amendment-1) T-R-601a Aug. 1, 1941

Rope: wire. (Amendment-4) RR-R-571 Aug. 1, 1941

Salt: table. (Amendment-4) SS-S-31 Aug. 1, 1941

Sausage: bologna-style. (Amendment-2) PP-S-71 Aug. 1, 1941

Sausage: frankfurter-style. (Amendment-3) PP-S-81 Aug. 1, 1941

Sausage: pork. (Amendment-2) PP-S-91 Aug. 1, 1941

Shrimp: canned. (Amendment-2) PP-S-311 Aug. 1, 1941

Solvent: dry-cleaning. (Amendment-1) P-S-661a Aug. 1, 1941

Spices: ground and whole. (Amendment-1) EE-S-631a Aug. 1, 1941 (Applicable to Navy Department purchases only)

Tape: rubber, insulating. (Amendment-1) HH-T-111a Aug. 1, 1941

Tongue: beef, canned. (Amendment-1) PP-T-571 Aug. 1, 1941 (Applicable to Navy Department purchases only)

Varnish: shellac. (Amendment-1) TT-V-91a Aug. 1, 1941 (Applicable to War Department purchases only)

The dates listed above indicate when the specifications become effective.

Air Conditioning Association Adopts Equipment Standards

Six equipment standards were approved and adopted by the Air Conditioning and Refrigerating Machinery Association, Inc., at meetings of the Association in May. The standards cover self-contained cooling air conditioning units; self-contained room coolers and self-contained room air conditioners; "Freon-12" evaporative condenser units; horizontal closed shell and tube "Freon-12" condensers; "Freon-12" liquid receivers; and location and inspection of data plate on insulated refrigerant containing vessels.

This makes a total of 25 equipment standards which ACRMA and its predecessor associations have adopted in the past three years.

Underwriters Give Defense Products Priority for Inspection and Testing

Underwriters' Laboratories announce that testing and inspection of products known to be for national defense are being given priority over other work, for example, testing of special lighting fixtures and electrical control equipment for explosive and loading plants, and investigation of explosion-proof motors for driving aeroplane fuel pumps and retracting landing gears.

Special attention is being given to inspection at factories in all parts of the United States for such defense materials as fire hose, fire extinguishers, fire-resistive roofing, heating equipment, electrical devices, and construction materials for use in cantonments and camps.

Use of Specifications Brings Lower Costs for Fire Hose

Approval by the American Standards Association of the latest edition of the Standard Specifications for Cotton Rubber-Lined Fire Hose for Public and Private Fire Department Use (L3.1-1941; ASTM D 296-38) developed by a sectional committee under the administrative sponsorship of the ASA Fire Protection Group (National Board of Fire Underwriters, National Fire Protection Association, Associated Factory Mutual Fire Insurance Companies, and Underwriters' Laboratories) and the American Society for Testing Materials, brings to the fore recent reports of centralized purchasing by leagues of municipalities. Nine leagues of cities, in Michigan, North Carolina, Oregon, Virginia, Wisconsin, Missouri, Arkansas, Texas, and Utah, now do some purchasing for their members, mostly in connection with fire hose.

The Michigan Municipal League was the first to tackle this problem, its service including in addition to fire hose, fire department accessories such as salvage covers, brass goods and extinguishers, water meters, street name signs, street push brooms and sweeper fibre, grader blades, and traffic paint. With the exception of Virginia and North Carolina, the other leagues are only interested in the purchase of fire hose. In addition to the leagues, a few important cities (Detroit, Milwaukee, Dayton, New York, for example) do their own buying on a scientific basis, using standard specifications and testing materials in their own laboratories.

Specifications Are Widely Used

The American Standard specifications for fire hose, which are identical with specifications recommended by the National Board of Fire Underwriters, are widely used by these cities in their purchases. A comparison of these specifications with tests on hose purchased has been tabulated by the Michigan League of Municipalities.

Although increase in efficiency and dollar savings are hard to compute in this type of activity, the Michigan League states that in general it takes credit "for driving the \$1.20 to \$1.50 per foot fire hose salesmen out of the larger municipalities." Municipalities purchasing on specification now, the League states, are receiving unit prices from 48 cents per foot to 60 cents per foot. Before 1930, when the Michigan service was initiated, only two municipalities in Michigan, Grand Rapids and Battle Creek, were purchasing hose on specification, and the average price per foot paid was \$1.25.

"We estimate," the League declares, "that the annual requirements of fire hose in Michigan are about 150,000 ft per year. If all of this hose were purchased on specification, the saving from an average of \$1.25 to an average of 60 cents per foot would amount to \$97,500 per year. It is not, however, all bought on specification. I would estimate that actually the saving is about \$50,000 per year for those municipalities taking advantage of specification purchasing."

One of the cities interested in centralized purchasing of fire hose on specification, Houston, Texas, has published a comprehensive survey of fire hose prices and purchase policies in American cities as compiled by its Research Department in May, 1940.

The American Standard covers specifications for cotton fabric, rubber lining, chemical composition, tensile properties, diameter, marking and sampling. It also includes provisions for life test, friction test, hydrostatic pressure, bursting strength, and kink tests.

Copies of the standard, Specifications for Cotton Rubber-Lined Fire Hose for Public and Private Fire Department Use (L3.1-1941; ASTM D 296-38), are available from the American Standards Association, 29 West 39th Street, New York, at 25 cents each.

Martino Named as Alternate On ASA Standards Council

R. A. Martino, Division of Codes and Specifications, National Bureau of Standards, has been named alternate representative of the U. S. Department of Commerce on the Standards Council of the American Standards Association. Mr. Martino succeeds Dr. M. G. Lloyd, whose sudden death left the position vacant.

Tool Committee Studies Standard Preferred Numbers

The American Standard Preferred Numbers are being studied by the ASA Sectional Committee on Classification of Materials for Tools, Fixtures, and Gages as a possible help in its work. The committee believes that the use of preferred numbers may be effective in reducing in a systematic manner the variety of materials for tools.

Railroad Committees Offer Proposals For New and Revised Standards

THE Operations and Maintenance Department of the Mechanical Division, Association of American Railroads, at the annual meeting of the Division June 19 and 20, heard reports from the following committees:

- Couplers and draft gears
- Tank cars
- Brakes and brake equipment
- Wheels
- Car construction
- Locomotive construction

Standardization was one of the important subjects discussed by all of the committees. Recommended changes were submitted by the committee on couplers and draft gears in draft gear specifications as a result of check tests of approved gears.

Revised specifications of the Interstate Commerce Commission for tanks to be mounted on or to form part of a car, which include provisions authorizing the use of fusion-welded tank car tanks, have resulted in a general revision of the AAR Specifications for Tank Cars, the committee on this subject reported.

Two New Brake Standards Recommended

Two new recommended practices, one for a device to prevent leakage of air from brake pipes, and the other covering a new four-position slow release retaining valve, were recommended by the committee on brakes and braking equipment. Other recommendations were made by this committee on lubrication of air brakes, emergency and service pistons for "AB" brakes of the self-lubricated type; and for combined dirt collector and cut-out cock.

Methods to be used in identifying cast-iron

wheels suitable for grinding have been outlined by the Committee on Wheels and if found to be reliable will be inserted in the Wheel and Axle Manual. The tables giving general dimensions of wrought-steel wheels for use on AAR axles with enlarged wheel seats have been amplified to include all tolerances and to cover wheels with rims thicker than the nominal 2½ inches. Recommended revisions were also submitted for the Wheel and Axle Manual, particularly in connection with identification marking for ground wheels, matching wheels to within variation of one inch in diameter in the same truck, spacing of rails on storage tracks, and thermal cracks.

As a result of additional experience in the construction and operation of AAR standard self-clearing hopper cars, changes have been proposed by the Committee on Car Construction in details of design and drawings covering sill steps, cubic capacity, body center plate (70-ton-hopper), and bolster center fillers. Design dimensions for separable pedestal type journal boxes are proposed as a revision of the AAR Manual of Standards.

The Committee on Locomotive Construction has proposed recommended practices on piston ring grooves for lip-type sectional packing, cylinder valve head studs, screwed pipe fittings for 300 lb. pressure—seamless steel couplings, standardization of globe and angle valves for steam locomotives for 300 lb. pressure, and stresses in locomotive rods. Standardization of wrought-steel wheels for Diesel locomotives has also been proposed.

Recommendations of the committees will be acted upon by the members of the Division before they are accepted as standards or approved recommended practices.

War Department Names Alternates On ASA Standards Council

Major Emerson L. Cummings, Ordnance Department, has been named by the War Department to serve as alternate representative on the Standards Council of the American Standards Association. Major Emerson succeeds Major W. J. D'Espinosa.

Lieutenant John H. Fitch, Ordnance Department, who acts as assistant in the Standards Division, has also been named as War Department alternate representative on the Standards Council.

Ask the ASA Library

What do the letters CV mean in connection with an electric motor? The American Standards Association Library answered this question by referring to an Argentine standard. The information helped an ASA member to bid in connection with a sale of electric motors to a buyer in Argentina.

National Bureau of Standards Shows Six Per Cent Increase in 1940

A SUBSTANTIAL increase in the services being performed by the National Bureau of Standards is reported by the Secretary of Commerce in his Annual Report, 1940, which calls attention to the fact that the Bureau's testing service alone showed a 6 per cent increase in 1940 over the preceding year. The Bureau acts as the principal testing laboratory for supplies (other than food and drugs) purchased by the Government. It does not, however, test materials for the public if suitable facilities are available elsewhere. Tests for industry and the public are in general limited to the calibration of instruments and working standards in terms of the national standards.

Eighty-Two Research Associates at Bureau

Eighty-two research associates are now stationed at the Bureau by national engineering societies and trade associations to carry on research projects. This cooperation helps to bring about prompt acceptance of research results in commercial practice.

Delays in the international program of measurements have prevented the introduction of the new units of electricity and of light into practice on January 1, 1940, the date set by the International Committee on Weights and Measures, the Secretary reported. Introduction of the units must wait until the International Committee meets again. Recommendations for a revision of the text defining the international temperature scale also must await a meeting of the International Committee on Weights and Measures before they are approved.

Activities of the National Bureau of Standards reported by the Secretary cover research, testing, and preparation of standards under the following classifications: Electricity; weights and measures; heat and power; optics; chemistry; mechanics and sound; organic and fibrous materials; metallurgy; clay and silicate products; and building materials and structures. In addition, the Bureau carries on work on Simplified Practice Recommendations; Trade Standards; and Codes and Specifications.

In its work in Trade Standards, the Secretary reported that the National Bureau of Standards promulgated 12 Commercial Standards in mimeographed form and nine in printed form during 1940. These include standards for book cloths, buckrams, woven dress fabrics, oil

Secretary of Commerce Reports on Research, Testing, and Standards

burners, builders' hardware, pipe nipples, sanitary cast iron enameled ware, fuel oils, Stoddard solvent, sunglass lenses (two kinds), solid hardwood wall paneling, hardwood interior trim, Douglas fir standard stock doors, and boys' button-on waists.

These standards, it is explained, are made a part of sales contracts (and enforceable as such) by voluntary guaranties on invoices, labels, or marks on the goods themselves.

The National Bureau of Standards cooperates with other organizations, including the American Standards Association. The Bureau is sponsor (or co-sponsor) for 26 projects carried out under the procedure of the ASA. It is represented on 160 ASA technical committees, with chairmanship of 15, vice-chairmanship of two, and secretaryship of seven. It is also represented on the ASA Board of Directors, the Standards Council, the Electrical Standards Committee, the Mechanical Standards Committee, the Advisory Committee on Ultimate Consumer Goods, the Safety Code Correlating Committee, and the Building Code Correlating Committee. Two members of the ASA staff are located at the Bureau to facilitate cooperation between the two organizations as well as between the ASA and other Government agencies.

Works Closely with Other Organizations

In addition to cooperation with the American Standards Association the Bureau takes part in the activities of 127 technical and trade organizations, and is particularly active in connection with the work of the American Society for Testing Materials. It is represented on 300 ASTM technical committees and subcommittees. It is also active in connection with the National Conference on Weights and Measures, the Interdepartmental Screw Thread Commission, and the American Gage Design Committee.

For specific information about the various fields of the Bureau's activity during the past year, any one interested may obtain the reprint from the annual report of the Secretary of Commerce. Requests should be sent to the National Bureau of Standards, Washington, D. C.

Foreign Standards Available For Loan from ASA Library

The national standardizing bodies of Australia, Canada, and Japan have sent copies of the following new standards to the American Standards Association. These may be borrowed by members of the ASA. The Japanese standards are available in English.

Australia

Street Lighting Code (CA 19-1939)

Canada

Essential Requirements and Minimum Standards Covering Electrical Equipment—Definitions and General Requirements (C22.2-No. 0-1941)

Japan

Methods of Chemical Analysis of Lead (226)
Oils for Paints (234)
Methods of Testing Oils for Paints (235)
Test Sieves for Aggregates for Concrete (238)
Construction of Land Boilers (248)
Dry Cells (257)
Thimbles for Steel Wire Ropes (265)
Thimbles for Hemp Ropes (266)
Shackles (267)
Rigging Screws (268)
Sunken Link Plates (269)
Case Hardening Steel (270)
Galvanized Steel Pipes for Water (271)
High-Grade Cast Iron Pipes for Water (272)
Definitions of Terms Relating to Heat Treatment of Iron and Steel (273)
Method of Chemical Analysis of Iron Ore for Determination of Sulphur (274) of Copper (275) of Chromium (276) of Titanium (277) of Alumina (278) of Lime (279) of Magnesia (280)
Printing Paper 01 (282) Printing Paper 02 (283)
Printing Paper 03 (284) Printing Paper 04 (285)

When requesting the above standards please refer to the symbol number as well as the title.

Heating Contractors Association Reports Action on Standards

The Standards Committee of the Heating, Piping, and Air Conditioning Contractors National Association reported action on American Standards as well as work on convector ratings and installation of a test hot water heating system for study by the National Bureau of Standards in Washington as important activities during the past year. The test heating system was figured according to the Association's national engineering standards, the committee's report explained. The tests were conducted in order to help establish for the government the results which could

be obtained from a well designed and installed hot water heating system. Results of the tests, conducted under the supervision of Richard S. Dill, in charge of thermal research at the National Bureau of Standards, have been made available by the Bureau and are published in the June issue of the Association's *Official Bulletin*.

As a result of a conference in Washington between manufacturers' representatives, representatives from the American Society of Heating and Ventilating Engineers, and the Heating, Piping, and Air Conditioning Contractors National Association, a committee has been appointed to draft a code for testing convectors. This work is especially important now, the Standards Committee explained, because of the interest of the United States Government in the subject.

The Association has been particularly active during the past year in the work of the ASA Sectional Committee on Standardization of Pipe Flanges and Fittings (B16), for which it is joint sponsor with the American Society of Mechanical Engineers and the Manufacturers Standardization Society of the Valve and Fittings Industry, the Standards Committee reported. The Association is also represented on several other ASA committees.

Standardization Improves Quality, Increases Output, Reduces Costs

"Improvement in the quality of goods has also helped to increase productivity," declares the pamphlet, *America's Factories*, published by the Public Affairs Committee, Incorporated.

"Similar results have been achieved through the development of standardization," the pamphlet continues. "In many industries this has made for greater precision and has thereby improved quality and at the same time reduced costs. This kind of development is characteristic of a developing economy. Progress occurs on all fronts, each advance supporting and stimulating others.

"Price also seems to be closely related to progress in production. It is interesting to note that the manufacturing industries that have forged ahead in production are usually the ones in which there has been more than an average cut in prices. In contrast, the industries which have maintained higher than average prices, as compared with industry as a whole, have lagged behind the others. It probably worked both ways. The industries which cut their prices were able to sell more and hence increase their output. And, at the same time, industries have found that increased output, particularly when achieved by better technical methods, has made possible reductions in the costs and thus in prices.

"In recent years many people have blamed the machine and increased technical efficiency for unemployment. It has been said that our widespread unemployment was a direct result of technological advance. The facts obtained from the present study indicate, however, that many of the industries which have reduced the amount of labor needed for each article—either by new machines or more efficient methods—have increased their production so greatly that they have actually employed more labor than ever before."

The pamphlet analyzes the changes in the growth of production and consumption of various manufactured products in the United States particularly since 1900. It is based on a recent study for the National Bureau of Economic Research covering the period from 1900 through 1937, four of the most eventful decades in our economic history as the pamphlet points out. During this period the total output of all the manufacturing plants in the United States increased by 276 per cent.

Copies of the pamphlet, *America's Factories 1899-1937*, by Maxwell S. Stewart, are available from the Public Affairs Committee, Inc., 30 Rockefeller Plaza, New York, at 10 cents per copy.

Lumber Decree Outlines Principles For Use of Standards and Labels

Limitations on the use of standards and grade marking in the marketing of lumber were outlined in a consent decree in the case of the National Lumber Manufacturers Association recently. The action, which was instituted under the supervision of Assistant Attorney General Thurman Arnold, was heard May 6 in the District Court of the United States for the District of Columbia.

In general, the decree provides that the use of standards, grade marks, or inspection services shall not be promoted unless these standards, marks, or services are available to all concerned under equal terms and conditions. Conversely, there must be no attempt to prevent the use of similar inspection or grading services carried out by any other organization.

An impartial agency is to be named with the consent of the court to pass on the competence of any lumber inspection agency and on the adequacy of the inspection service provided. The decree provides that the Association shall not recommend the use of grade-marked lumber unless the grade mark and inspection service have been passed upon by such an impartial agency.

The American Lumber Standards (Simplified Practice Recommendation R16, published in 1924 by the National Bureau of Standards) are to

More Standardization, Less Variety Planned for Increased Production

"In the past we have devoted much of our energy and resources to the pleasant task of multiplying the varieties and assortments of the things offered to the consuming public. . . .

"But in a time of emergency much of that kind of effort is waste. We cannot afford to use up time, material, and labor making two dozen varieties of one article if we can get along with three or four varieties. If the workers and machines and managerial skill not used to make those extra, unneeded varieties are set free for other employment, we can increase *both* our production of defense goods and our production of goods for consumers. I believe that it is possible to increase our present productive capacity by a fourth or perhaps even by a third by reducing the variety of goods offered to the commercial trade. . . .

"Plans for launching such a program are being perfected, and within a very short time it will get under way. It will be done in a truly democratic way. Committees of manufacturers, distributors, and consumers will meet together to plan the ways in which simplification can be used to best advantage."

—From an address by Donald M. Nelson, Director of Purchases, Office of Production Management, before the National Association of Manufacturers, June 16, 1941.

be changed, according to the decree, to include standards to help determine the adequacy of inspection and the competence of the inspection agency. They are also to be changed in order to help facilitate approval of rules for the grading and measurement of lumber and the administration of lumber inspection, grade marking, and other certification services as provided in this decree.

In addition to the provisions on standards and grade-marking the decree includes requirements against price fixing and limitation of production.

ASTM Asks ASA Approval On 13 Pigment Standards

The American Society for Testing Materials has submitted 13 standards relating to pigments to the American Standards Association for approval as American Standards. The group includes four specifications and nine methods of test and supplements some 25 standards in this field which have already been approved as American Standards. These standards were developed by ASTM Committee D-1 on Paint, Varnish, Lacquer, and Related Products. The standards just submitted include the following:

ASTM Standard Specifications for:

- Basic Sulfate White Lead (D 82-38)
- Blue Lead: Basic Sulfate (D 405-38)
- C. P. Para Red Toner (D 475-40)
- C. P. Zinc Yellow (Zinc Chromate) (D 478-40)

ASTM Standard Methods of Test for:

- Alkalinity or Acidity of Pigments (D 278-31)
- Bleeding of Pigments (D 279-31)
- Hygroscopic Moisture (and Other Matter Volatile Under the Test Conditions) in Pigments (D 280-33)
- Oil Absorption of Pigments (D 281-31)
- Acetone Extract in Dry Lampblack and Dry Bone Black (D 305-31)
- Tinting Strength of White Pigments (D 332-36)
- Mass Color and Tinting Strength of Color Pigments (D 387-36)

ASTM Methods of Chemical Analysis of:

- Yellow and Orange Pigments Containing Chromium Compounds, Blue Pigments, and Chrome Green (D 126-36)
- Dry Mercuric Oxide (D 284-33)

Any comments on the approval of these standards should be forwarded to the American Standards Association office promptly. Copies of the standards may be obtained from the ASA office or from the American Society for Testing Materials, 260 South Broad Street, Philadelphia.

NFPA Stops Work on Model Electrical Law

The proposed standard model law for electrical inspection on which the National Fire Protection Association has been working for some time failed to receive the necessary action at the NFPA convention in Toronto in May. The proposal was declared by President Alvah Small to be improperly before the association, and the drafting committee was discharged by practically unanimous vote of the delegates present.

The movement to obtain such a draft law originated about four years ago with a number of state fire marshals in the Middle West, and

was due to the widespread extension of electrical service in rural areas where it was felt that no adequate inspection provisions existed.

The proposed law was published in the advance reports of the Toronto meeting by the electrical law committee of the association. However, the laws and ordinances committee declined to approve or concur in the publication of the proposed model electrical law as an advance report that might be circulated in use in drafting legislation, largely on the ground that such a law in its opinion should be built definitely around the National Electrical Code and the listings of the Underwriters Laboratories, Inc.

"The backers of the proposed law sought to offer a workable statute draft to states in which inspection requirements, particularly in rural areas, appear inadequate," reports *Electrical World*, May 24. "They endeavored to avoid the difficulties which arose in Michigan when the Supreme Court of that state declared the electrical inspection law invalid on the ground of improperly delegated authority."

"The National Electrical Contractors' Association and the REA representatives favored the law.

"The opposition, which was much in evidence among the delegates, took the position that existing inspection authorizations and facilities suffice for present conditions."

Victor H. Tousley of Chicago, field engineer of the association, reported that the National Board of Fire Underwriters now places electrical causes as first in connection with fire losses. In industry one fire in four is now electrical in origin and the average loss exceeds \$1,000.

Women Want Standards

"In the opinion of more than half of the 1,127 women queried by Dr. Harry Deane Wolfe, associate professor of marketing at Kent State University, Kent, Ohio, the use of standards and specifications that are not too technical can serve immeasurably to improve department store advertising. The women interviewed included members of social clubs, parents' organizations, church and college groups.

"The survey reflected a feeling on the part of 75 per cent of the women that retail advertising lacks essential facts and tends to exaggerate values."

—*Forecast*, April, 1941.

Meat Standards and Grading Show New Developments

TWO recent developments in connection with the use of standards and specifications for meats and in meat grading have been noted recently.

First, Federal meat specifications are being revised to conform to Agricultural Marketing Service standards, the U. S. Department of Agriculture announces, and it is expected that a wider range of meat products, particularly fresh meats, will be bought by the Army. This is the result of a recent conference of leaders in the livestock industry with officials of the Army Quartermaster Corps and the Division of Purchases, Office of Production Management. As production conditions warrant, the Department of Agriculture announces, "full consideration will be given to the use of other grades whose quality is satisfactory to the Army and which are in surplus."

Second, lamb producers in Virginia, West Virginia, North Carolina, and Tennessee, have been trying out a different marketing method, in which they grade the lambs according to U. S. standards before offering them for sale. They then sell the lambs on that basis, which more nearly gives each producer the actual worth of his lambs. The plan has met with considerable success, according to *Marketing Activities*, published by the Agricultural Marketing Service, U. S. Department of Agriculture.

Selling lambs on the basis of standard grades follows the principle that a given lot of lambs may be divided into six separate and more or less distinct groups according to their conformation, finish, and quality. The grades are: Prime, Choice, Good, Medium, Common, and Cull. Since the Prime grade is a specialty product and represented by an extremely small number, the Choice grade may be considered the top grade from a market point of view.

"Choice grade lamb is the highest grade generally recognized at the markets and, as the name implies, is an animal that closely approaches the ideal," explains *Marketing Activities*. "Choice grade lambs, as a rule, have a higher dressing percentage and produce carcasses of relatively higher value than the Good grade, and may properly be expected to command a higher market price."

Lamb grading in the four states, Virginia, West Virginia, North Carolina, and Tennessee, is a function of state agencies, the graders being employed and paid by the states. One or more times during the year, however, a representative of the U. S. Department of Agriculture travels through these areas to supervise the application of the Federal standards. Approximately 225,000 lambs were graded in the four states last year.

Retailers Find Savings in Standardization of Box Sizes

Results of the simplification program carried out by the National Bureau of Standards at the request of the National Retail Dry Goods Association, and the reasons for the program, are described in an article "Why and How Standardization Cuts Retail Expense," by J. D. Malcolmson, technical director of the Robert Gair Company, Inc. The article was published as one of a series, which also included articles about standardization of paper bags and folding boxes, and appeared in the *Bulletin* of the National Retail Dry Goods Association, May. A few quotations from Mr. Malcolmson's article give some idea of the retailer's problem with box sizes, and the results of the simplification program:

"The importance of size simplification in the Supply Department is obvious," Mr. Malcolmson states, "when one considers the enormous quantities of packaging material ordered by these departments. For example, fifty million folding

boxes alone were purchased by NRDGA members in 1937 and the quantities of corrugated boxes, set up boxes, and paper bags were proportionately high. . . .

"... it was found that 52 per cent of this folding box volume occurred in connection with only 9 out of 683 different sizes and that 15 out of 889 sizes of corrugated containers accounted for 24 per cent of that total volume. This made it possible to effect very striking reductions in sizes on these two items so that it has now been possible to recommend for the new standards only 23 different folding boxes and 58 corrugated containers.

"From the standpoint of the box manufacturer these simplifications have made possible the quoting of much lower prices due to the larger quantities that are involved on any one size. Many buyers do not realize the reasons why small quantities of corrugated containers, and especially folding boxes, are necessarily so high in terms of price per thousand. The reason, of course, is the disproportionate effect of the preparation cost."

Brass Bands Better Than Orchestras —

At least in keeping to the American Standard pitch, Bell Laboratories' engineer finds

Brass bands keep their music to the American Standard pitch, based on 440 cycles per second for the A above middle C, better than do the symphony orchestras, O. J. Murphy of the Bell Telephone Laboratories has found in a study of broadcast music. Mr. Murphy reports the results of his study in the *Journal of the Acoustical Society of America*. He included in his study only three brass groups, however, compared with 19 symphonies.

Mr. Murphy found a tendency of the orchestras to rise during a concert. In the case of four leading symphonies the greatest change was 2.5 cycles per second for the A above middle C. For all the orchestras the variation was about twice as much, or 4.7 cycles. The change of 2.5 cycles represents about a tenth of a half tone, or the difference between A and A sharp.

In 1936, the American Standards Association approved an American Standard for Acoustical

Terminology (Z24.1-1936) which adopted as standard the equal tempered chromatic scale with A above middle C at 440 cycles per second. On this scale A flat is 415.30 cycles and A sharp 466.16 cycles. Mr. Murphy's measurements were intended to determine how closely the musical performers of the United States are adhering to this standard.

Mr. Murphy used an electric filter on his radio set, which passed the vibrations ranging from 420 to 460 vibrations per second and included only the A note. This was compared with a standard oscillator. This, in turn, was checked regularly with the National Bureau of Standards broadcast, which sends out a standard 440-cycle note continuously.

"A series of measurements comprising some 750 observations was made on various types of musical programs," says Mr. Murphy. "The mean value of the pitch for all observations was 441.3 cycles per second and the extremes observed were 434 for a dance band and 448 on two occasions for string quartets. Approximately 70 per cent of the observations were from 439 to 443 cycles per second."

The most accurate instrument, judging from the studies, is the electric organ, of which eight were measured, Mr. Murphy reported. The mean was 439.9 cycles for the A note, with the minimum 437 and the maximum 440.9. Pipe organs ranged from 435.5 to 442.

Street Lighting Recommendations To Help Lighting Engineers

The "Recommended Practice of Street Lighting, 1940" prepared by the Committee on Street and Highway Lighting of the Illuminating Engineering Society, is now available.

Purpose of the publication is to furnish the technical basis upon which effective street lighting may be designed, either as a coordinated plan for an entire street system or as a plan for any subdivision of such a system.

The recommendations are compromises between the ideal and present practice and to some extent are concessions to practicability.

The many and varying conditions of street and traffic which are found in the average community make it impracticable to set up lighting specifications for all local situations likely to be encountered in practice. Therefore, the committee has confined the subject matter in this edition to the fundamental principles of street illumination and to general specifications covering good street lighting practice. Taking these criteria as a base, the committee believes that it will be possible for the engineer or street lighting specialist to draw up

a specification to meet any unusual street lighting situation.

Copies of the bulletin are available from the Illuminating Engineering Society, 51 Madison Avenue, New York, at 15 cents each.

NFPA Shows How to Defend Against Air-Set Fires

Fire Defense, a compilation of authoritative information on defense against air-set fires and bombs, is now available from the National Fire Protection Association. The book is based on British experience in fighting incendiary and explosive bombs, and gives information on the ingredients used in these bombs, and how they operate, as well as how best to combat them. It also includes sections on sabotage, organizations for civilian defense, keeping communication systems open, and how to protect defense production.

Copies of the book can be obtained from the National Fire Protection Association, 60 Battery-march Street, Boston, Mass., at \$1.50 each.

Revised "Rules" Include Specifications and Tests for Cotton Textiles

The revised edition of Worth Street Rules, which have come to be recognized as the standard code of procedure and trade custom in the purchase and sale of cotton textiles, has just been completed. The Rules are approved and promulgated by 13 major textile groups, including such organizations as the Textile Fabrics Association, the Cotton-Textile Institute, the International Association of Garment Manufacturers, the Union-made Garment Manufacturers Association, four cotton manufacturers' associations, the Wholesale Dry Goods Institute, Inc., the National Association of Purchasing Agents, the Textile Brokers Association, and the Association of Cotton Textile Merchants of New York.

Specifications for the fine fancy goods and cotton and synthetic yarn mixtures, for fine staple grey goods, for carded grey goods, and for goods sold for rubberizing and pyroxylin coating are included.

Other sections give definitions and trade customs, and data concerning testing woven textile

fabrics. The Commercial Standard for Testing and Reporting Woven Textile Fabrics, CS59-41, which became effective March 28, 1941, is given in full. This standard covers test requirements for breaking strength, colorfastness to chlorine of cotton and linen fabrics, colorfastness to cleaning, colorfastness to crocking, and colorfastness to laundering, to light, to perspiration, and to pressing. It also includes requirements for testing for shrinkage in cleaning and in laundering, as well as for resistance to yarn slippage.

The Trade Practice Rules for the Shrinkage of Woven Cotton Yard Goods promulgated by the Federal Trade Commission June 30, 1938, and the Trade Practice Rules for the Cotton Converting Industry promulgated by the Federal Trade Commission August 18, 1939, are also included in full.

The Worth Street Rules, effective April 17, 1941, can be obtained from any one of the organizations which approved them, at 50 cents per copy.

New Unit Describes Vitamin D Content in Poultry Feed

The Food and Drug Administration has announced that a new unit, the AOAC chick unit, has been adopted for use in describing the vitamin D potency in preparations for poultry feeding. Use of the new unit on labels will prevent misbranding, it declares.

For some time poultry raisers used cod liver oil as a source of vitamin D in prevention of rickets in chickens. The vitamin D potency was stated in terms of USP units. An increasing variety of products other than cod liver oil are now on the market, however, as sources of vitamin D for use in poultry feeding, and in some instances the anti-rachitic effectiveness for chicks of the vitamin preparation cannot be measured by the USP method. This is due to the difference in biological activity for the chick of various forms of vitamin D.

The Association of Official Agricultural Chemists, recognizing the existence of this condition, has adopted a method for measuring the anti-rachitic value of vitamin D preparations intended for poultry feeding, and describes the vitamin D potency as the AOAC chick unit. This unit is equal in biological activity for the chick to one unit of vitamin D in USP reference cod liver oil.

An article which may be used as a source of vitamin D for poultry or an ingredient which

may be used to increase the vitamin D content of such a product, labeled only in terms of USP units, may be misbranded under the Food, Drug, and Cosmetic Act for failure to reveal facts material in the light of such a representation.

The label of such a product should reveal the fact that the declaration of the vitamin D potency in terms of USP units is not a reliable index of its anti-rachitic value for the chick. This may be accomplished by a label statement in connection with the potency declaration to the effect that the vitamin D in the article is in whole or in part unavailable to the chick, or by an additional potency declaration in terms of AOAC units.

Pacific Purchasor Discusses Conveyor Belting Problems

Problems in buying conveyor belting due to lack of satisfactory specifications and laboratory methods of test are described in an article "Selecting Conveyor Belting," in *Pacific Purchasor*, March, 1941. Factors which combine to make a successful rubber belt are mostly hidden, making testing difficult, the article explains. It discusses each of these factors and the reasons for difficulty with specifications.

Pacific Purchasor is published by the Purchasing Agents' Association of Northern California, Inc., 433 California Street, San Francisco, Cal.

Standardization Aids Lower Costs, Increases Volume in Housing

STANDARDIZATION is one of the major aids to lower costs and increased volume in housing, finds the Temporary National Economic Committee in a report on Housing prepared for the TNEC by Peter A. Stone of the WPA Construction Analysis Unit and R. Harold Denton, Housing Analyst of the U.S. Department of Commerce. The wide variety of designs, materials, and methods used to accomplish a single purpose boosts costs all along the line, from the manufacturer to the site laborer, the report declares. Analysis of only 16 USHA projects has revealed the use of not less than 56 different sizes of casement windows, 200 different varieties of interior doors, and hundreds of molding designs. At least 20 different types of lock could be applied to each type of door, it was found.

While windows with their frames constitute one of the few mass-produced parts of a house, the expected economy is limited by the small variations in the size of window openings from one community to another. Thus, for seven eastern localities it was discovered that seven

TNEC Report Discloses 56 Casement Window Sizes, 200 Varieties of Doors

different sizes of glass must be ordered for the same type of double-hung window. Other examples of wasteful multiplicity in stock material dimensions are noted. For instance, there are 76 varieties of brass lavatory and sink traps (reduced from 1,114 through the activity of the Division of Simplified Practice of the National Bureau of Standards), 300 sizes of slate roofing (after a 75 per cent reduction). A single manufacturer reports 82 different kinds and sizes of double-hung windows ready for delivery as stock items in its regional warehouses.

"Until an adequate program of industrial research is provided," concluded the TNEC report, "active encouragement should be given the National Bureau of Standards and the American Standards Association in the standardization of building materials and structural dimensions."

Government Research Reported To Help In Design of Plumbing

"For many years, differences between the plumbing regulations or plumbing code requirements of various localities have been a source of annoyance to builders, owners, and public health officials, and have hindered the standardization, on a general or national scale, of plumbing materials and equipment, and of construction design," declares the *Technical News Bulletin* of the National Bureau of Standards for March, 1941.

"The tendency in plumbing codes has been to crystallize certain types of construction, prohibiting the use of simplifications and economies that recent research on the flow in plumbing systems has shown to be safe and satisfactory," the *Bulletin* states.

In this connection, the National Bureau of Standards announces, the Bureau has been studying the hydraulics of plumbing systems since 1921, and is now preparing a series of papers

giving the results of this investigation and describing their application. Building Materials and Structures Report BMS 65, which has just been released, is one of this series. It deals with the estimation of the maximum flow or "load" that may be anticipated in any given plumbing system in a building, both in the water-supply system and in the drainage system. It also describes the characteristic types of sewage flow that occur in the drainage system and explains how the nature of the flow changes as it passes through the system from the plumbing fixtures to the street sewer.

Tables and charts based on the relations between the probable maximum frequencies of use of the different kinds of fixtures and the known flow characteristics are given for the benefit of designers of plumbing systems. It is not necessary, the Bureau explains, to design the supply and drainage piping of the plumbing system to

take care of the flow of all of the fixtures operating simultaneously. It is possible to establish maximum frequencies of use of the different kinds of fixtures and from these frequencies and the known flow characteristics to compute by the theory of probability the maximum number of fixtures that will be in operation simultaneously for a given fraction of the time; for example, one per cent of the time. A plumbing system designed to take care, in a wholly satisfactory manner, of the maximum number of fixtures that will be in operation one per cent of the time, will safely handle double that number. Use of the tables and charts included in the report should assure safe and satisfactory operation of the systems designed in this way, the Bureau declares.

Copies of BMS 65 may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D. C. at 10 cents each.

Proposed Regulations for Foods For Special Dietary Uses

Proposed regulations relating to foods for special dietary uses have been announced by the Federal Security Agency.

The proposed regulations have been drawn up to give effect to section 403(j) of the Federal Food, Drug, and Cosmetic Act, which declares a food misbranded if it is represented as a food for special dietary use and its label does not bear the information required by the regulations. Such information as vitamin, mineral, and other dietary properties of food, which would be necessary to fully inform purchasers as to its value for special dietary uses is required in the proposed regulations.

The proposed regulations if approved will supersede the proposals previously published. "The original proposals," the Federal Security Agency states, "had resulted in considerable misunderstanding, as many food interests gained the impression that the proposed label statements were derogatory in character." It is the view of Agency officials, however, that simple factual statements can be prescribed which will be of great value to the rapidly increasing numbers of consumers interested in dietary matters, and that such statements will not hamper honest and fair sale of food products for special dietary use but will promote confidence in dietary claims to the advantage of both producers and consumers.

According to the statement by the Federal Security Agency, the dairy industry in particular showed concern about the scope of the regulations, but administrative officials disclaim any intention to regard milk, cheese, butter, and other dairy products as foods for special dietary use

"ASA Work Significant" In Voluntary Regulation

"The best conceivable regulation of industry is voluntary regulation within the industry itself, and in this field the American Standards Association is accomplishing significant work. By patient study its commissions are establishing standards of manufacturing and trading practice which are eliminating costly litigation and much confusion in many branches of American industry. Government experts representing fifty different bureaus or agencies are co-operating in this work, and State Legislatures have in important instances agreed to accept the standards thus set in lieu of law-made standards.

"A report on this subject by Howard Coonley and P. G. Agnew, officers of the American Standard Association, has just been published and will interest any person who wishes to see how well free enterprise can work when the opportunity is given."

—Editorial, *New York Sun*, May 24.

when they contain no added dietary factors and are sold for what they are, without claim of having special dietary value. Administrative officials point out that producers can therefore exercise their own choice as to whether or not they subject their products to the special labeling requirements.

South Africa Considers More Standardization

The Industrial and Agricultural Requirements Commission of South Africa, in a recent report to Parliament, recommended that a committee be appointed to report on the possibility of reducing the number of standards and of extending standardization to all industry. The Commission also recommended that the findings of this committee be enforced by the Government, if approved.

The Commission believes that such a standardization policy would "enable local manufacture to meet South African requirements to a greater degree and would facilitate the provision of essential stocks in the national interest."

How Standards Help The Purchasing Agent

"From the standpoint of the welfare of his fellowman, his company, and his country, there are certain facts which purchasing agents might well keep in mind.

"First, that establishment of standards and rigid adherence to them until superseded by better standards is absolutely the only certain way to ensure orderly and expeditious progress.

"Second, standards have unquestionably had a marked influence on the manufacturing, and sales, and testing activities of every important producer and consumer in the materials field.

"Third, definite reference to recognized standards in purchase contracts has tended to eliminate losses and delays by curbing misunderstandings and misinterpretations.

"Fourth, it is highly essential to any industry that those who are experienced and who have intimate contact with standards work should assist, and the purchasing agent can directly or indirectly influence this trend.

"Fifth, that only by having a forum where everyone who has a right to be heard can be heard, are we assured of that final judgment which will command adherence and respect. For as Elihu Root once pointed out, there is inherent fragility of action based primarily on legal authority and there is almost irresistible power inherent in the judgment of a body of men possessing no power to enforce that judgment but who are recognized to be men of ability and character and who form their opinions with studied deliberation."

—From "National Defense Focuses Attention on Standards," by C. L. Warwick, secretary-treasurer, American Society for Testing Materials, "Pacific Purchasor," June, 1941.

Draft Standards Issued by Great Britain and New Zealand

The American Standards Association has recently received copies of new draft standards published by the British Standards Institution and the New Zealand Standards Institute. The library of the ASA is very willing to loan the draft standards to any of its members. The drafts are as follows:

Great Britain

Motion Picture Films (CF CM 7820)
Tolerances for Plain Limit Gauges (CF ME 7844)
Use of Timber in Building Construction (CF TIB 7956)
High Purity Zinc—Zinc Alloys for Die Casting, Parts 1 & 2—and Sampling and Analysis of High Purity Zinc and Zinc Alloys for Die Castings, Parts 1, 2, and 3 (CF NF 8060)

New Zealand

Bucket Pumps (D 1446)
School Exercise Books, Writing Pads, Drawing Books and Drawing Sheets (D 1447)

Bureau of Standards Lists Publications on Radiometry

The National Bureau of Standards has issued a list of its publications on Radiometry, including a section of general information on the Bureau's radiometry studies and a synopsis of its investigations. The bibliography is arranged under the general headings: Instruments and methods of radiometry; measurement of radiation in absolute units; determination of the absorptive, emissive and reflective properties of materials; thermoelectrical and photoelectrical properties of materials; visibility of radiation, nocturnal radiation; photochemical action of ultraviolet radiation; germicidal and erythemato-genic action of ultraviolet radiation; and preliminary reports and miscellaneous papers dealing with applications of radiometry to illumination and medicine.

The pamphlet, Letter Circular LC-635, can be obtained from the National Bureau of Standards, U. S. Department of Commerce, Washington, D. C.

Government to Develop Plastics Standards

A technical committee is now being formed to develop Federal Specifications for plastics. Increased use of plastics by Government agencies and the armed forces of the nation has led to the need for such specifications to simplify purchasing procedure, *Domestic Commerce* explains.

ASA Standards Activities

Approved Standards Available Since Publication of Our June Issue

Building Code Requirements for Reinforced Gypsum Concrete A59.1-1941 25¢
Reamers B5.14-1941 75¢
Listing Requirements for Semi-Rigid Gas Appliance Tubing and Fittings (Revision of Z21.24-1937) Z21.24-1941 50¢
Approval Requirements for Portable Gas Baking and Roasting Ovens Z21.28-1941 \$1.00
Listing Requirements for Furnace Temperature Limit Controls and Fan Controls Z21.29-1941 50¢

Standards Approved Since Publication of Our June Issue

Inspection Requirements for Motor Vehicles (Revision of D7-1939) D7.1-1941
Dimensions for Film Pack Tabs and Films Z38.1.1-1941
Dimensions for Film Pack Cases Z38.1.2-1941
Dimensions for 70 mm Perforated (and Unperforated) Film for Other Than Motion Picture Purposes Z38.1.3-1941

Standards Now Being Considered by Standards Council for ASA Approval

Manhole Frames and Covers for Subsurface Structures A35.1
Calcined Gypsum for Dental Plasters (ASTM C 72-40) A65.1
Keene's Cement (ASTM C 61-40) A66.1
Gypsum Lath (ASTM C 37-40) A67.1
Gypsum Sheathing Board (ASTM C 79-34) A68.1
Gypsum Wall Board (ASTM C 36-34) A69.1
Methods of Testing Gypsum and Gypsum Products (ASTM C 26-40) A70.1
T-Slots, their Bolts, Nuts, Tongues and Cutters (Revision of B5a-1927, from status of American Tentative Standard to American Standard) B5.1
Jig Bushings (Revision of B5.6-1935)
Keyways for Holes in Gears B6.4
Cast-Iron Pipe Flanges and Flanged Fittings, Class 250 (Revision of B16b-1928)
American Standard Safety Code for Jacks B30
Preferred Thicknesses for Uncoated Thin Flat Metals (Under 0.250 In.) B32.1
Gage Blanks CS 8-41 (Revision of American Standard B47-1933)
Definitions of Special Terms, Section 1 of the National Electrical Safety Code C2, Section 1
Electric Fences, Part 6 of the National Electrical Safety Code C2, Part 6
Protection of Structures Containing Inflammable Liquids and Gases—Part 3 of Code for Protection Against Lightning (From status as American Tentative Standard to American Standard) C5, Part 3
Definitions of Electrical Terms C42

Commercial Standards for Sun Glass Lenses (CS 78-39; CS 79-39)

Specifications for Basic Sulfate White Lead (ASTM D 82-38) K47
Specifications for Blue Lead: Basic Sulfate (ASTM D 405-38) K48
Specifications for C.P. Para Red Toner (ASTM D 475-40) K49
Specifications for C.P. Zinc Yellow (Zinc Chromate) (ASTM D 478-40) K50
Methods of Test for Alkalinity or Acidity of Pigments (ASTM D 278-31) K51
Methods of Test for Bleeding of Pigments (ASTM D 279-31) K52
Methods of Test for Hygroscopic Moisture (and Other Matter Volatile Under the Test Conditions) in Pigments (ASTM D 280-33) K53
Methods of Test for Oil Absorption of Pigments (ASTM D 281-31) K54
Methods of Test for Acetone Extract in Dry Lampblack and Dry Bone Black (ASTM D 305-31) K55
Methods of Test for Tinting Strength of White Pigments (ASTM D 332-36) K56
Methods of Test for Mass Color and Tinting Strength of Color Pigments (ASTM D 387-36) K57
Methods of Chemical Analysis of Yellow and Orange Pigments Containing Chromium Compounds, Blue Pigments, and Chrome Green (ASTM D 126-36) K58
Methods of Chemical Analysis of Dry Mercuric Oxide (ASTM D 284-33) K59
Body Sizes for Boys' Garments L11.1
Proposed American Recommended Practice for the Use of Explosives in Anthracite Mines M27
Gas Water Heaters (Revision of Z21.10)
Listing Requirements for Attachable Gas Water Heating Units (Revision of Z21.26)
Approval Requirements for Gas Counter Appliances Z21.31
Public Approval and Certification Procedures Z34
Grinding, Buffing and Polishing Equipment Sanitation Z43

New Project Being Considered

Spray Solution Used in Connection with Spray Systems for the Prevention of Offset on Printing Presses

Defense Emergency Standards

Standards Under Way

Allowable Concentration of Acetone Z37
Allowable Concentration of Azides, Lead and Sodium Z37
Allowable Concentration of Cadmium Z37
Allowable Concentration of Ether Z37
Allowable Concentration of Manganese Z37
Allowable Concentration of Tetryl Z37
Allowable Concentration of TNT Z37
Allowable Concentration of Xylol Z37

—AMERICAN STANDARD BUILDING REQUIREMENTS—

Reinforced Gypsum Concrete

First completed standard in a series of recommended building code requirements being prepared through the American Standards Association

Developed by many organizations and individuals working together under the leadership of:

BUILDING OFFICIALS CONFERENCE OF AMERICA, INC.
GYPSUM ASSOCIATION

A standard practice for construction of reinforced gypsum concrete floors and roofs, with regard to:

Materials,
Strength,
Allowable stresses,
Design,
Inspection

Reinforced Gypsum Concrete (A59.1-1941)..... 25c.

(8 page booklet bound in heavy paper)

Order from

American Standards Association

29 West 39th Street

New York